Diploma in

IT, Networking and Cloud

Module 4

Web Development

Lab Manual

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Learning Outcomes

After completing this module a student will be able to:

1. Able to understand how the web works.
2. Structuring the Web
3. Scripting and Styling the web
4. Enhancing the web using PHP
5. Understand Java the key language

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Learning Outcome 1 - Able to understand how the web works

After achieving this learning outcome, a student will be able to understand how the web works. In order to achieve this learning outcome, a student has to complete the following:

1. Create web page content using HTML (HyperText Markup Language) Tags (5 Hrs)
2. Enable Hypertext Transfer Protocol (HTTP) via GET and POST requests (5Hrs)
3. Obtain input from users. (5 Hrs)

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Activity 1

Aim: Create web page content using HTML (HyperText Markup Language) Tags (5 Hrs)

Learning outcome: Able to understand how the web works.

Duration: 5 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS…...
2. Text Editors- Notepad++,Sublime Text,etc..
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
<title>Black Goose Bistro</title>
</head>
<!--Body Content Starts-->
<body text=”blue”>
<!--Heading-->
<h1>Black Goose Bistro</h1>
<hr color=”green”>
```

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<!--Heading-->

<h2>The Restaurant</h2>

The Black Goose Bistro offers casual lunch and dinner fare in a hip atmosphere. The menu changes regularly to highlight the freshest ingredients.

<!--Heading-->

<h2>Catering</h2>

You have fun... we'll do the cooking. Black Goose catering can handle events from snacks for bridge club to elegant corporate fundraisers.

<!--Heading-->

<h2>Location and Hours</h2>

Seekonk, Massachusetts; Monday through Thursday 11am to 9pm, Friday and Saturday, 11am to midnight

</body>

<!--Body Content Ends-->

</html>

Output/Results snippet:

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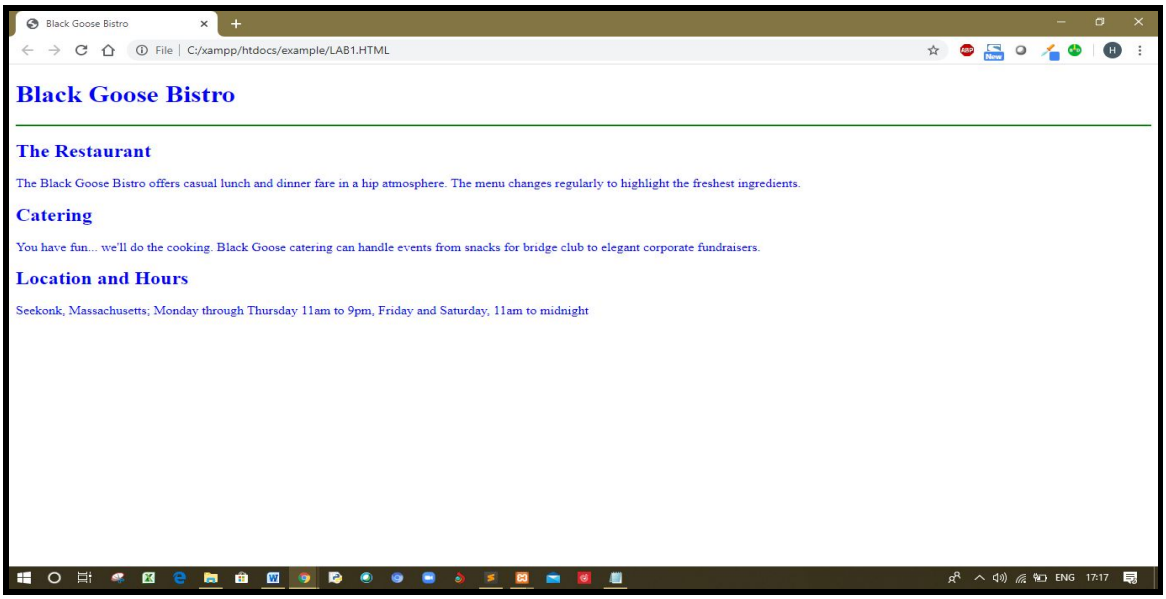
Black Goose Bistro
File | C:/xampp/htdocs/example/LAB1.HTML
Black Goose Bistro
The Restaurant
The Black Goose Bistro offers casual lunch and dinner fare in a hip atmosphere. The menu changes regularly to highlight the freshest ingredients.
Catering
You have fun... we'll do the cooking. Black Goose catering can handle events from snacks for bridge club to elegant corporate fundraisers.
Location and Hours
Seekonk, Massachusetts; Monday through Thursday 11am to 9pm, Friday and Saturday, 11am to midnight

References:

- https://www.oreilly.com/library/view/learning-web-design/9781449337513/ch04.html

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Activity 2

Aim: Enable Hypertext Transfer Protocol (HTTP) via GET and POST requests (5Hrs)

Learning outcome: Able to understand how the web works.

Duration: 5 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS…...
2. Text Editors- Notepad++,Sublime Text,etc..
3. XAMPP/LAMP Server Setup
4. Browser

Code/Program/Procedure (with comments):

GetPost.Html

```
<!DOCTYPE html>

<html>

<head>

<title>Get </title>

</head>

<!--Body content Starts-->

<body>

<form action="action_page.php" method="get" target="_blank">

Name: <input type="text" name="fname" size="20"></br>

Age: <input type="text" name="age" size="20"></br>

<!--Click on the submit button, and the input will be sent to a page on the server called
```

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```
"/action_page.php".-->
<input type="submit" value="Submit">
</form>
<p>Click on the submit button, and the input will be sent to a page on the server called
"/action_page.php".</p>
</body>
<!--Body content Ends-->
</html>

<!DOCTYPE html>
<html>
<head>
<title>Post </title>
</head>
<!--Body content Starts-->
<body>
<form action="action_page.php" method="post" target="_blank">
Name: <input type="text" name="fname" size="20"></br>
Age:<input type="text" name="age" size="20"></br>
<!--Click on the submit button, and the form will be submitted using the POST method.-->
<input type="submit" value="Submit">
</form>
```

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```
<p>Click on the submit button, and the form will be submitted using the POST method.</p>
</body>
<!--Body content Ends-->
</html>
```

action_page.php

```
<?php
 if( isset($_GET["fname"]) && isset($_GET["age"] ))
 {
//Display Name and Age in Get Method
 echo "Welcome ". $_GET['fname']. "<br />";
 echo "You are ". $_GET['age']. " years old.";
 exit();
 }
?>

<?php
 if( isset($_POST["fname"]) && isset($_POST["age"] ))
 {
//Display Name and Age in POST Method
 echo "Welcome ". $_POST['fname']. "<br />";
```

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```
echo "You are ". $_POST['age']. " years old.";
exit();
}
?>
```

Output/Results snippet:

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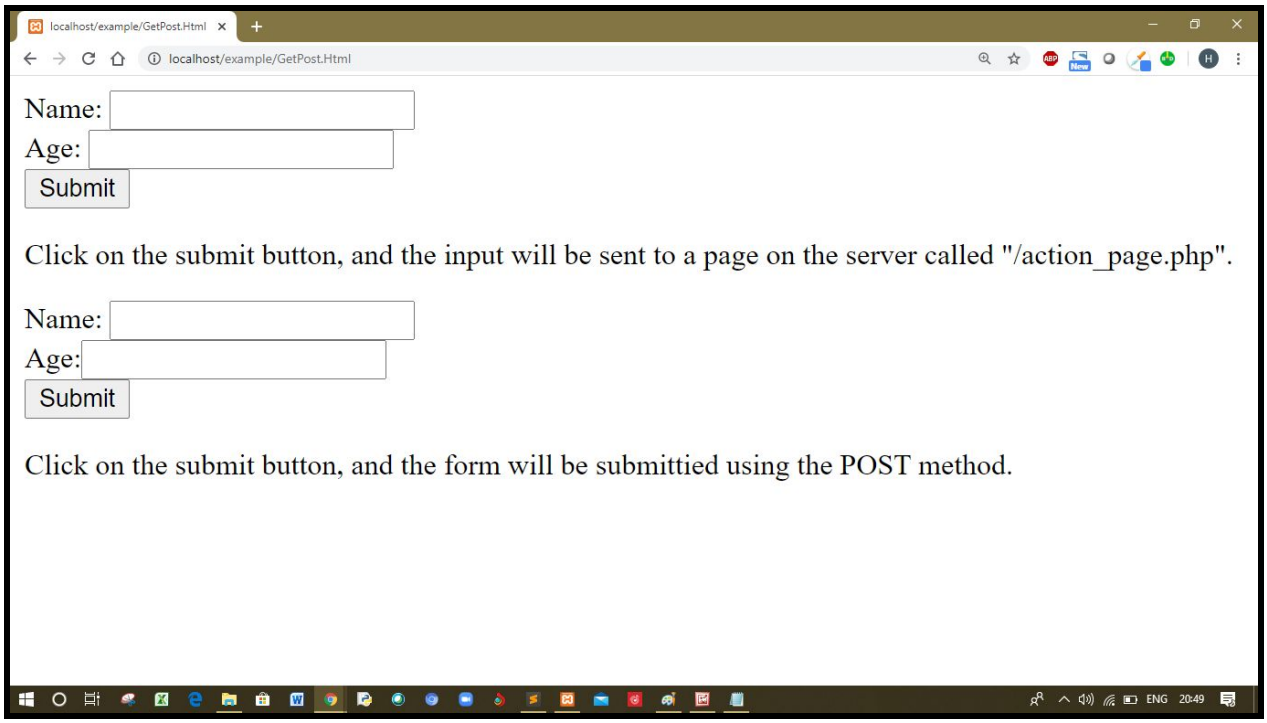
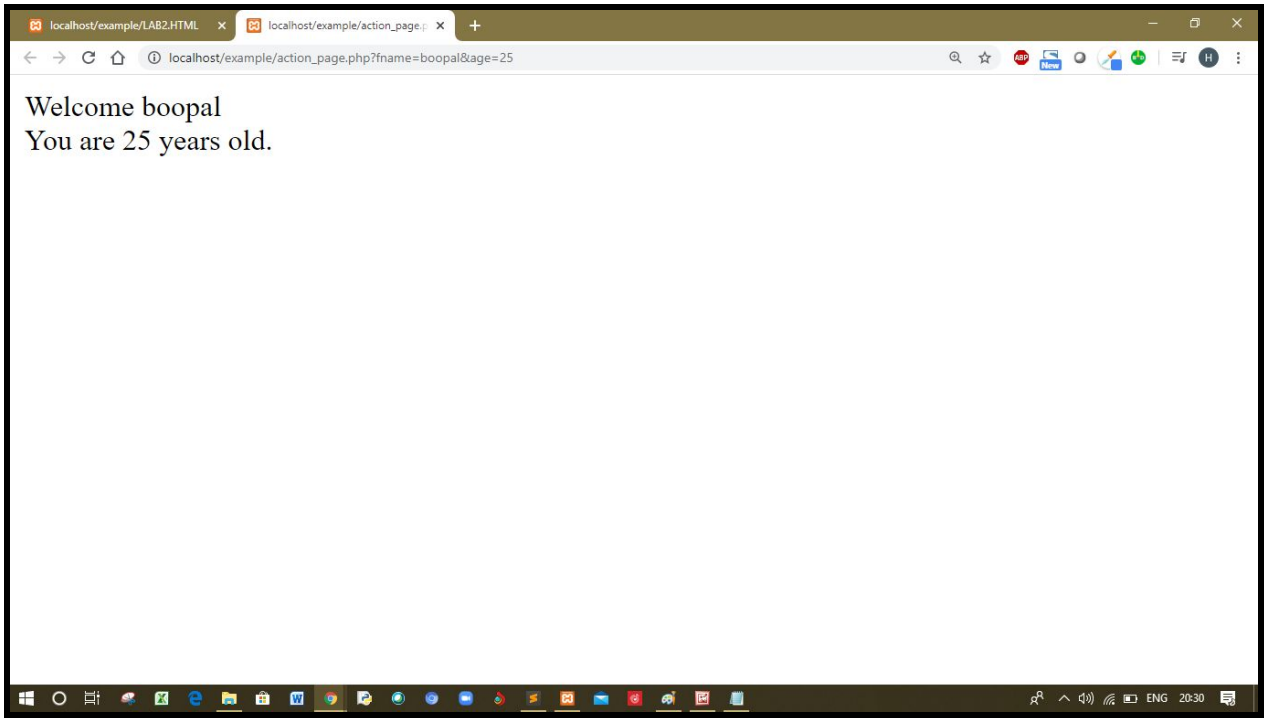

localhost/example/GetPost.Html
localhost/example/GetPost.Html
Name:
Age:
Submit
Click on the submit button, and the input will be sent to a page on the server called "/action_page.php".
Name:
Age:
Submit
Click on the submit button, and the form will be submittied using the POST method.

GET Method URL



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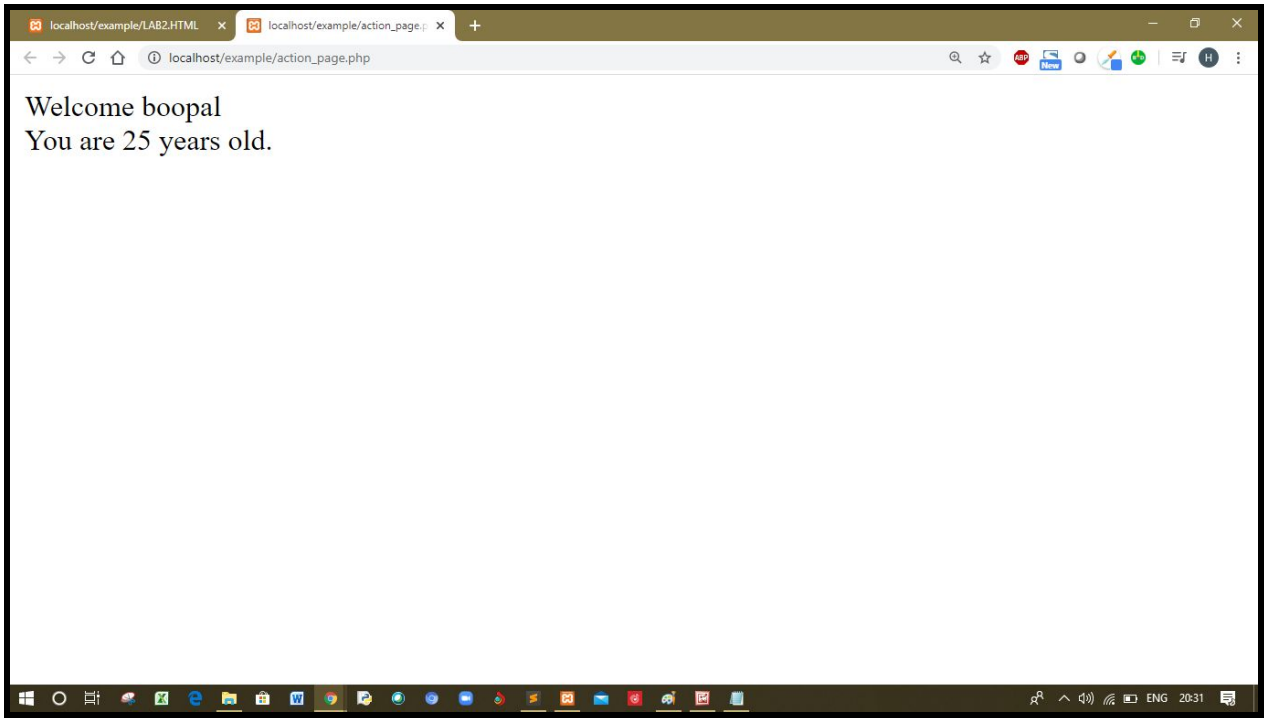
POST Method URL



References:

- https://www.guru99.com/php-forms-handling.html

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Activity 3

Aim: Obtain input from users. (5 Hrs)

Learning outcome: Able to understand how the web works.

Duration: 5 hours

List of Hardware/Software requirements:

1. Windows/Ubuntu OS…...
2. Text Editors- Notepad++,Sublime Text,etc..
3. XAMPP/LAMP Server Setup
4. Browser

Code/Program/Procedure (with comments):

Users.html

```
<html>
  <head>
    <title> Users </title>
  </head>
<!--Body Content Starts-->
  <body>
    <form action="retrieve.php" method="post">
      Username: <input type="text" name="username" value="" /></br>
      Password: <input type="password" name="password" value= "" /></br>
<!--If you click the "Submit" button, the form-data will be sent to a page called "/retrieve.php"-->
```

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```
        <input type="submit" name="submit" value="Submit" />
<p>If you click the "Submit" button, the form-data will be sent to a page called
"/retrieve.php".</p>
 </form>
   </body>
<!--Body Content Ends-->
</html>
```

retrieve.php

```
<?php
//Display user Details
   echo "<pre>";
   print_r($_POST);
   echo "</pre>";
   echo "Username : {$_POST['username']}<br>";
   echo "Password : {$_POST['password']}";
?>
```

Output/Results snippet:

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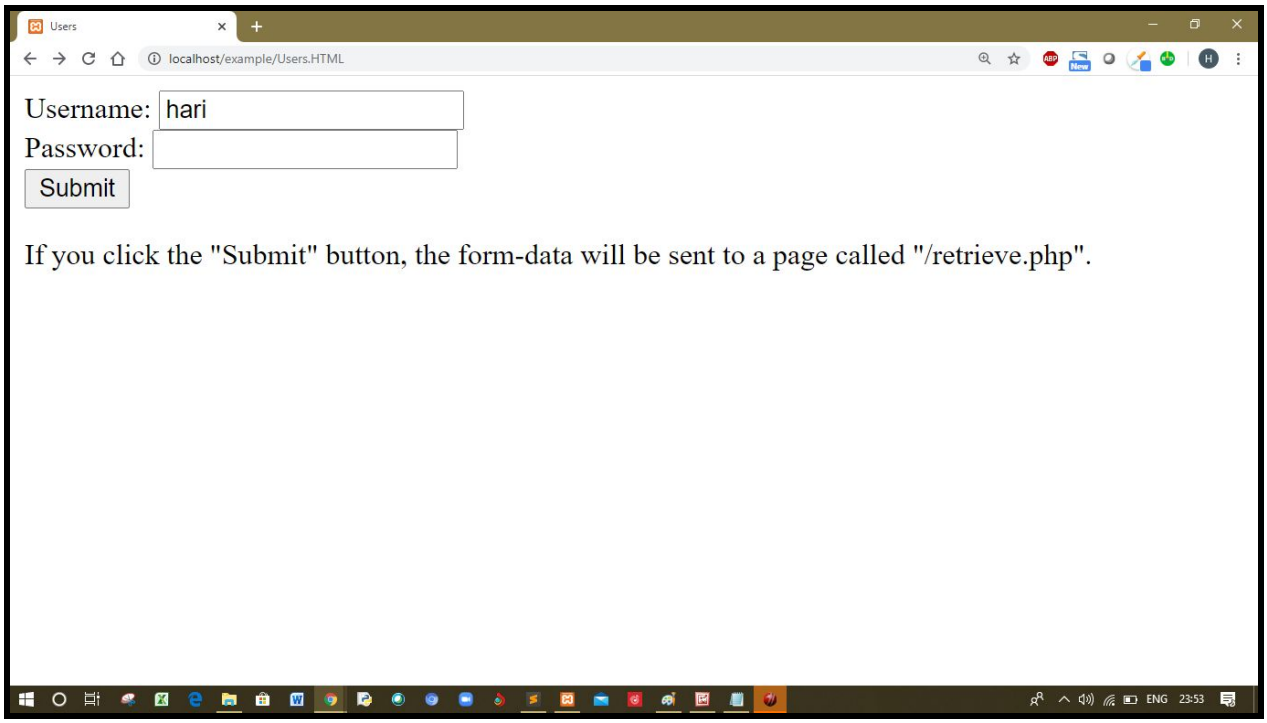

Obtain User Details

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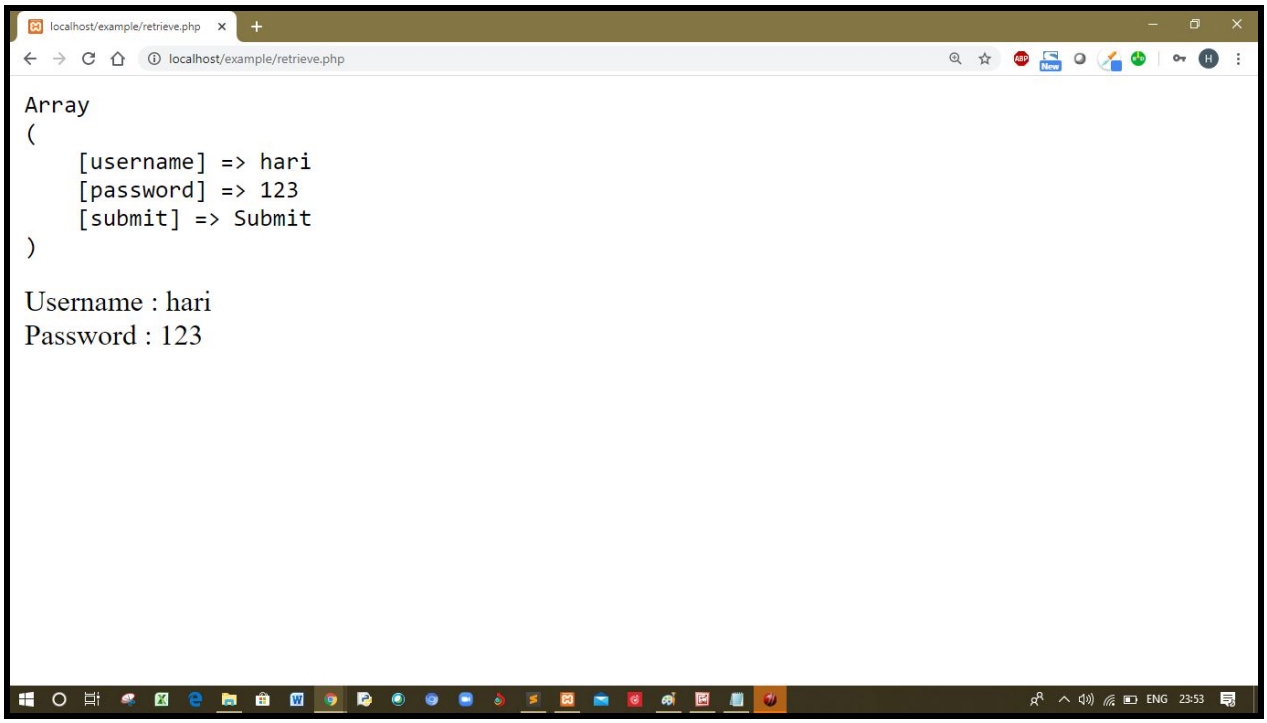

References:

- https://www.programming-techniques.com/2012/02/php-tutorial-getting-user-input-in-php-using-html-form.html

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Learning Outcome 2 - Able to understand structuring the web

After achieving this learning outcome, a student will be able to understand structuring the web. In order to achieve this learning outcome, a student has to complete the following:

1. Divide a webpage into logical sections (1Hr)
2. Set up structure of headings and paragraphs (1Hr)
3. Display computer code with HTML (1Hr)
4. Annotation of images and graphics. (2Hr)
5. Marking abbreviations (1 Hr)
6. Add quotations and citations to web pages (2 Hrs)
7. Embed a webpage within another webpage (2Hrs)
8. Add Flash content within a webpage (3Hrs)
9. Create a data spreadsheet (2 Hrs)
10. Create HTML tables (1Hrs)
11. Optimize HTML table rendering (1Hr)
12. Create collapsible content with HTML (1Hr)
13. Add context menus to a webpage (2Hr)
14. Create dialog boxes with HTML (2Hrs)
15. Add multiple languages into a single webpage (2Hrs)
16. Controlling of HTML line breaking (1Hrs)
17. Mark changes (added and removed text) (2Hrs)
18. Add responsive image to a webpage (3Hrs)
19. Add vector image to a webpage (3Hrs)
20. Add a hit map on top of an image (2Hrs)

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Activity 1

Aim: Divide a webpage into logical sections (1Hr)

Learning outcome: Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS…...
2. Text Editors- Notepad++,Sublime Text,etc..
3. Browser

Code/Program/Procedure (with comments):

Divide.html

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
  <title>My page title</title>
  <link href="https://fonts.googleapis.com/css?family=Open+Sans+Condensed:300|Sonsie+One" rel="stylesheet" type="text/css">
    <link rel="stylesheet" href="style.css">
<!-- the below three lines are a fix to get HTML5 semantic elements working in old versions of Internet Explorer-->
    <!--[if lt IE 9]>
```

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```
    <script src="https://cdnjs.cloudflare.com/ajax/libs/html5shiv/3.7.3/html5shiv.js"></script>
<![endif]-->
 </head>
<body>
   <!-- Here is our main header that is used across all the pages of our website →
<!--Header Starts-->
<header>
     <h1>Header</h1>
   </header>
<!--Header Ends→
<!--Navigation Menu Starts-->
 <nav>
     <ul>
       <li><a href="#">Home</a></li>
       <li><a href="#">Our team</a></li>
       <li><a href="#">Projects</a></li>
       <li><a href="#">Contact</a></li>
     </ul>
<!-- A Search form is another common non-linear way to navigate through a website. →
 <form>
        <input type="search" name="q" placeholder="Search query">
        <input type="submit" value="Go!">
```

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```
    </form>
  </nav>
<!--Navigation Menu Ends→
<!-- Here is our page's main content -->
  <main>
<!-- It contains an article -->
    <article>
 <h2>Article heading</h2>
      <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Donec a diam lectus. Set sit amet ipsum mauris. Maecenas congue ligula as quam viverra nec consectetur ant hendrerit. Donec et mollis dolor. Praesent et diam eget libero egestas mattis sit amet vitae augue. Nam tincidunt congue enim, ut porta lorem lacinia consectetur.</p>
  <h3>Subsection</h3>
      <p>Donec ut librero sed accu vehicula ultricies a non tortor. Lorem ipsum dolor sit amet, consectetur adipisicing elit. Aenean ut gravida lorem. Ut turpis felis, pulvinar a semper sed, adipiscing id dolor.</p>
  <p>Pelientesque auctor nisi id magna consequat sagittis. Curabitur dapibus, enim sit amet elit pharetra tincidunt feugiat nist imperdiet. Ut convallis libero in urna ultrices accumsan. Donec sed odio eros.</p>
 <h3>Another subsection</h3>
      <p>Donec viverra mi quis quam pulvinar at malesuada arcu rhoncus. Cum soclis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. In rutrum accumsan ultricies. Mauris vitae nisi at sem facilisis semper ac in est.</p>
      <p>Vivamus fermentum semper porta. Nunc diam velit, adipscing ut tristique vitae sagittis vel odio. Maecenas convallis ullamcorper ultricied. Curabitur ornare, ligula semper consectetur sagittis, nisi diam iaculis velit, is fringille sem nunc vet mi.</p>
```

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```
    </article>

    <!-- the aside content can also be nested within the main content -->
    <aside>
      <h2>Related</h2>
<ul>
        <li><a href="#">Oh I do like to be beside the seaside</a></li>
        <li><a href="#">Oh I do like to be beside the sea</a></li>
        <li><a href="#">Although in the North of England</a></li>
        <li><a href="#">It never stops raining</a></li>
        <li><a href="#">Oh well...</a></li>
      </ul>
    </aside>
  </main>
  <!-- And here is our main footer that is used across all the pages of our website -->
  <footer>
    <p> ©Copyright 2020 All rights Reserved.</p>
  </footer>
 </body>
</html>
```

style.css

```
html, body {
  margin: 0;
  padding: 0;
}
html {
  font-size: 10px;
  background-color: #a9a9a9;
}
body {
  width: 70%;
  margin: 0 auto;
}
/* || typography */

h1, h2, h3 {
  font-family: 'Sonsie One', cursive;
  color: #2a2a2a;
}
p, input, li {
  font-family: 'Open Sans Condensed', sans-serif;
  color: #2a2a2a;
```

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```
}

h1 {
  font-size: 4rem;
  text-align: center;
  color: white;
  text-shadow: 2px 2px 10px black;
}
h2 {
  font-size: 3rem;
  text-align: center;
}
h3 {
  font-size: 2.2rem;
}
p, li {
  font-size: 1.6rem;
  line-height: 1.5;
}
/* || header layout */
nav, article, aside, footer {
  background-color: white;
```

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```
  padding: 1%;
}
nav {
  height: 50px;
  background-color: #ff80ff;
  display: flex;
  margin-bottom: 10px;
}
nav ul {
  padding: 0;
  list-style-type: none;
  flex: 2;
  display: flex;
}
nav li {
  display: inline;
  text-align: center;
  flex: 1;
}
nav a {
  display: inline-block;
  font-size: 2rem;
```

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```
  text-transform: uppercase;
  text-decoration: none;
  color: black;
}
nav form {
  flex: 1;
  display: flex;
  align-items: center;
  height: 100%;
  padding: 0 2em;
}
input {
  font-size: 1.6rem;
  height: 32px;
}
input[type="search"] {
  flex: 3;
}
input[type="submit"] {
  flex: 1;
  margin-left: 1rem;
  background: #333;
```

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```
  border: 0;
  color: white;}
/* || main layout */
main {
  display: flex;
}
article {
  flex: 4;
}
aside {
  flex: 1;
  margin-left: 10px;
  background-color: #ff80ff;
}
aside li {
  padding-bottom: 10px;
}
footer {
  margin-top: 10px;
}
```

Output/Results snippet:

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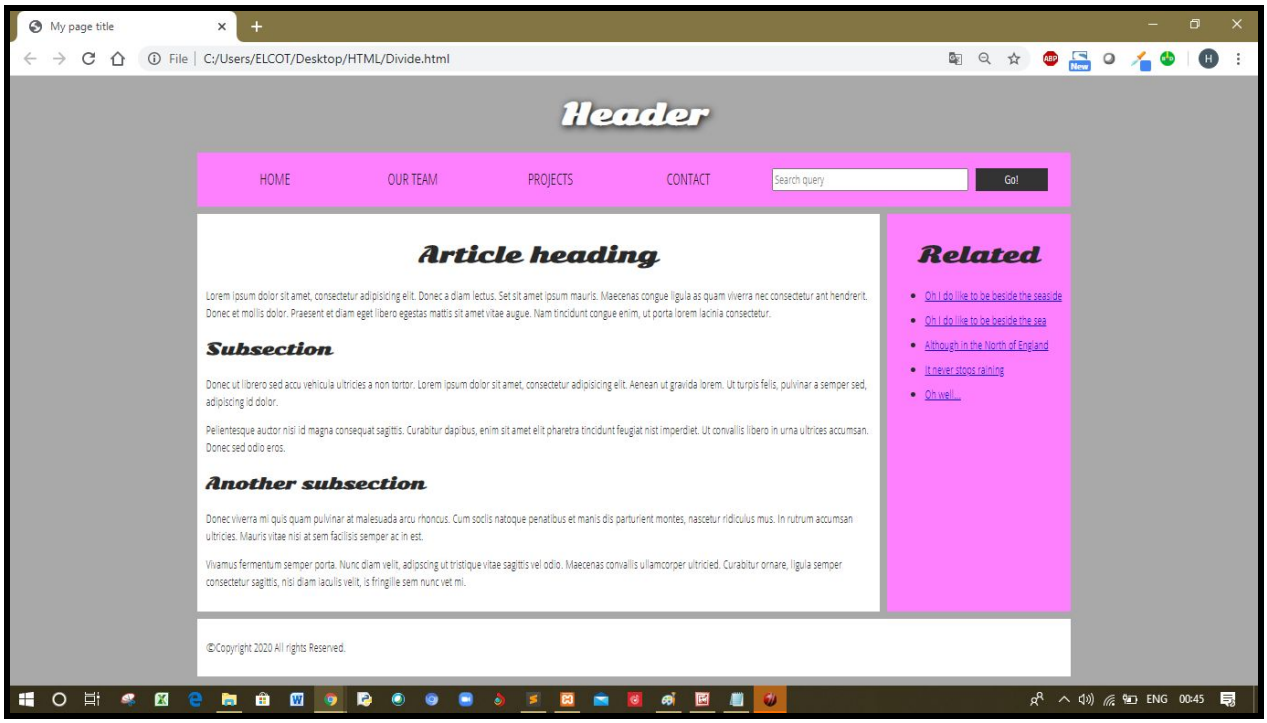
My page title
File | C:/Users/ELCOT/Desktop/HTML/Divide.html
Header
HOME
OUR TEAM
PROJECTS
CONTACT
Search query
Go!
Article heading
Lorem ipsum dolor sit amet, consectetur adipisicing elit. Donec a diam lectus. Set sit amet ipsum mauris. Maecenas congue ligula as quam viverra nec consectetur ant hendrerit. Donec et mollis dolor. Praesent et diam eget libero egestas mattis sit amet vitae augue. Nam tincidunt congue enim, ut porta lorem lacinia consectetur.
Subsection
Donec ut librero sed accu vehicula ultricies a non tortor. Lorem ipsum dolor sit amet, consectetur adipisicing elit. Aenean ut gravida lorem. Ut turpis felis, pulvinar a semper sed, adipiscing id dolor.
Pellentesque auctor nisi id magna consequat sagittis. Curabitur dapibus, enim sit amet elit pharetra tincidunt feugiat nist imperdiet. Ut convallis libero in urna ultrices accumsan. Donec sed odio eros.
Another subsection
Donec viverra mi quis quam pulvinar at malesuada arcu rhoncus. Cum soclis natoque penatibus et manis dis parturient montes, nascetur ridiculus mus. In rutrum accumsan ultricies. Mauris vitae nisi at sem facilisis semper ac in est.
Vivamus fermentum semper porta. Nunc diam velit, adipscing ut tristique vitae sagittis vel odio. Maecenas convallis ullamcorper ultricied. Curabitur ornare, ligula semper consectetur sagittis, nisi diam iaculis velit, is fringille sem nunc vet mi.
Related
Oh I do like to be beside the seaside
Oh I do like to be beside the sea
Although in the North of England
It never stops raining
Oh well...
©Copyright 2020 All rights Reserved.
ENG 00:45

References:

- https://developer.mozilla.org/enUS/Learn/HTML/Howto/Divide_a_webpage_into_logical_sections

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Activity 2

Aim: Set up structure of headings and paragraphs (1Hr)

Learning outcome: Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS…...
2. Text Editors- Notepad++,Sublime Text,etc..
3. Browser

Code/Program/Procedure (with comments):

```
<html>
<head>
        <title>Proper Heading and Paragraph</title>
</head>
<body>
<!--Header Starts-->
<header>
<h1>Heading 1</h1>
WEB DEVELOPMENT
</header>
```

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```
<!--Header Ends-->
<nav aria-labelledby="mainnavheader">
<h2 id="mainnavheader">Navigation Menu</h2>
...
</nav>
<!--Main Content Starts-->
<main>
<!--Article content Starts-->
<article>
<h2>An inside look at the Heading2</h2>
<nav aria-labelledby="tocheader">
<h3 id="tocheader">Table of Contents</h3>
...
</nav>
<p>...</p>
<p>paragraph 1.</p>
<p>...</p>
<ul>
<li>list 1.</li>
<li>list 2.</li>
<li>list 3.</li>
</ul>
```

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```
<h3>Cotton Fur</h3>
<p>paragraph 2.</p>
<p>...</p>
<aside aria-labelledby="relatedheader">
<h3 id="relatedheader">Related Articles</h3>
<ul>
<li><a href="#">Related Article Title 1</a></li>
<li><a href="#">Related Article Title 2</a></li>
<li><a href="#">Related Article Title 3</a></li>
</ul>
WEB DEVELOPMENT
</aside>
</article>
<!--Article content Ends-->
<aside aria-labelledby="latestheader">
<h3 id="latestheader">Latest Articles</h3>
<ul>
<li><a href="#">Latest Article Title 1</a></li>
<li><a href="#">Latest Article Title 2</a></li>
<li><a href="#">Latest Article Title 3</a></li>
</ul>
</aside>
```

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```
</main>
<!--Main Content Ends-->
<!--Footer Starts-->
<footer>
<p>© paragraph Inc.</p>
</footer>
<!--Footer Ends-->
</body>
</html>
```

Output/Results snippet:

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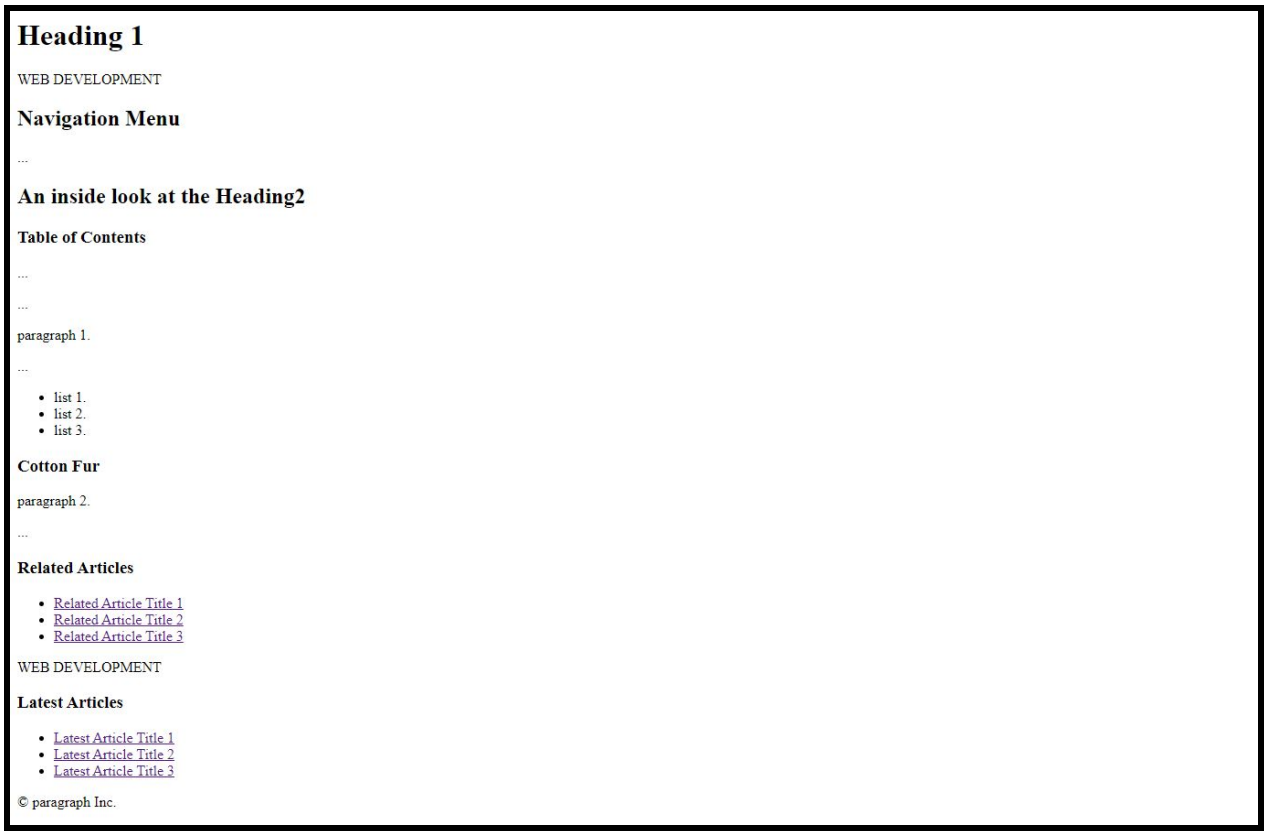

Activity 3

Aim: Display computer code with HTML (1Hr)

Learning outcome: Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS…...
2. Text Editors- Notepad++,Sublime Text,etc..
3. Browser

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Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<title>Code in HTML</title>
<body>
<h2>Computer Code</h2>
<p style="font-weight: bolder;">Some programming code:</p>
<!--Computer Code Starts-->
<code>
x = 5;</br>
y = 6;</br>
z = x + y;
</code>
<!--Computer Code Ends>
<p style="font-weight: bolder;">C programming code:</p>
<!--Computer Code Starts-->
<pre>
<code>
//C Programming Code
#include<stdio.h>
```

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```
int main() {
   printf("Hello...");
}
</code>
</pre>
<!--Computer Code Ends>
</body>
</html>
```

References:

- https://www.geeksforgeeks.org/html-computer-code-elements/

Output/Results snippet:

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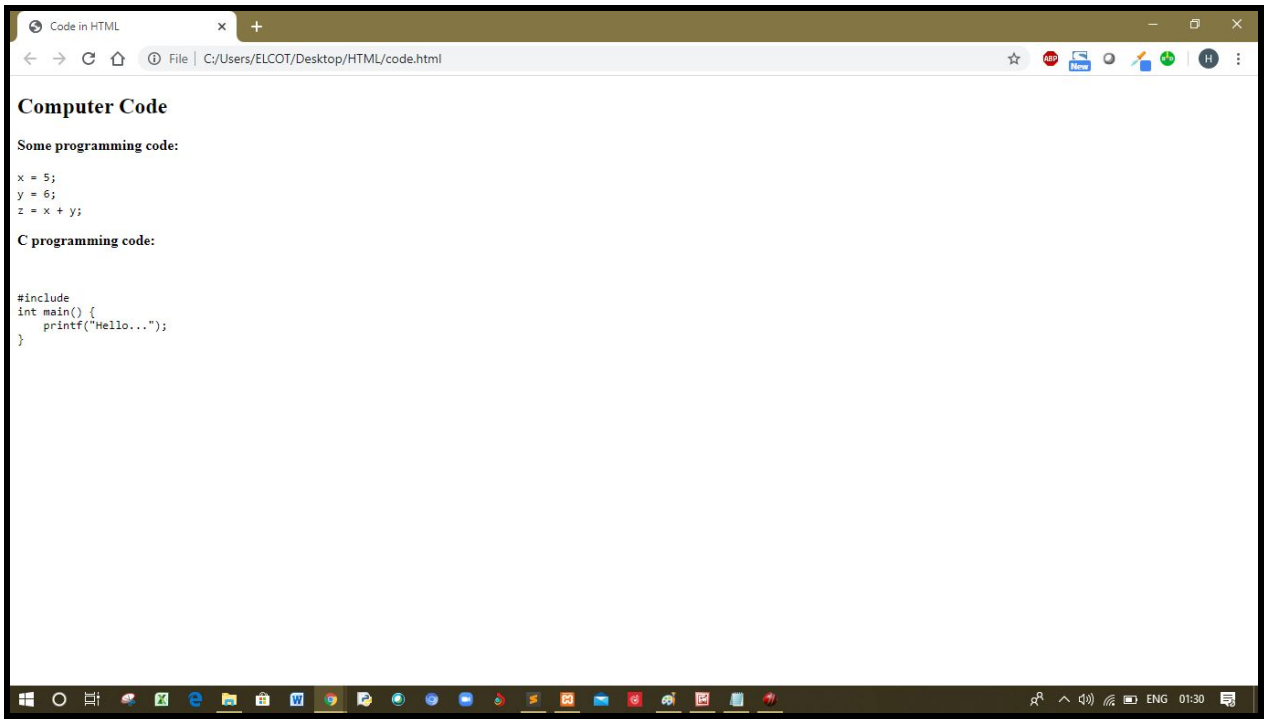

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Activity 4

Aim: Annotation of images and graphics. (2Hr)

Learning outcome: Structuring the web.

Duration: 2 hours

List of Hardware/Software requirements:

1. Windows/Ubuntu OS…...
2. Text Editors- Notepad++,Sublime Text,etc..
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE HTML>
<html>
<style>
figure{border: 2px solid black;border-style:ridge;}
figcaption{font-family:Arial; padding:10px; background:#fa4b2a; color:#fff;}
</style>
<body>
<!--single Image-->
 <figure>
 <img src="mushcloud.jpg"
            alt="Mushroom_Cloud"
```

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```
        height="300" width="1265"/> <br>
        <figcaption>
A Mushroom Cloud over a volcanic eruption
   </figcaption>
</figure>
<!--Multiple Images-->
<figure>
  <img src="maina.jpg" alt="maina" height="300" width="300"/>
  <img src="kuruvi.jpg" alt="kuruvi" height="300" width="300"/>
  <img src="hum.jpg" alt="humming" height="300" width="300"/>
  <img src="parrot.jpg" alt="parrot" height="300" width="336"/>
  <figcaption>Indian Birds. From left to right, Maina, Kuruvi,Humming and Parrot.</figcaption>
</figure>
</body>
</html>
```

Output/Results snippet:

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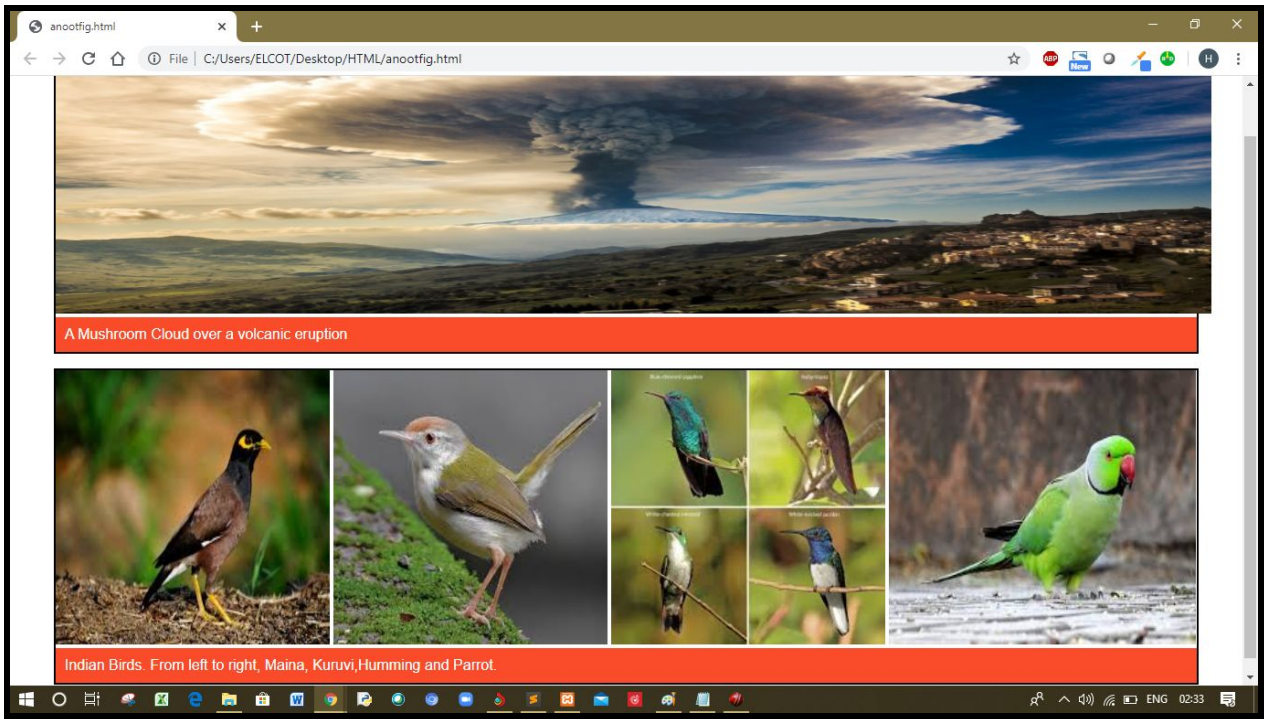

References:

- https://developer.mozilla.org/en-US/docs/Learn/HTML/Multimedia_and_embedding/Images_in_HTML

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Activity 5

Aim: Marking abbreviations (1 Hrs)

Learning outcome: Able to Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<p>The <abbr title="World Health Organization">WHO</abbr> was founded in 1948.</p>
</body>
</html>
```

Output/Results snippet:

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Image1: Marking Abbreviations

References:

- https://www.w3schools.com/tags/tag_abbr.asp
- https://developer.mozilla.org/en-US/docs/Web/HTML/Element/abbr

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Activity 6

Aim: Add quotations and citations to web pages (2 Hrs)

Learning outcome: Able to Structuring the web.

Duration: 2 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<p>Here is a quote from WWF's website:</p>
<blockquote cite="http://www.worldwildlife.org/who/index.html">
For 50 years, WWF has been protecting the future of nature.
The world's leading conservation organization,
WWF works in 100 countries and is supported by
1.2 million members in the United States and
close to 5 million globally.
</blockquote>
```

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```
</body>

</html>
```

Output/Results snippet:

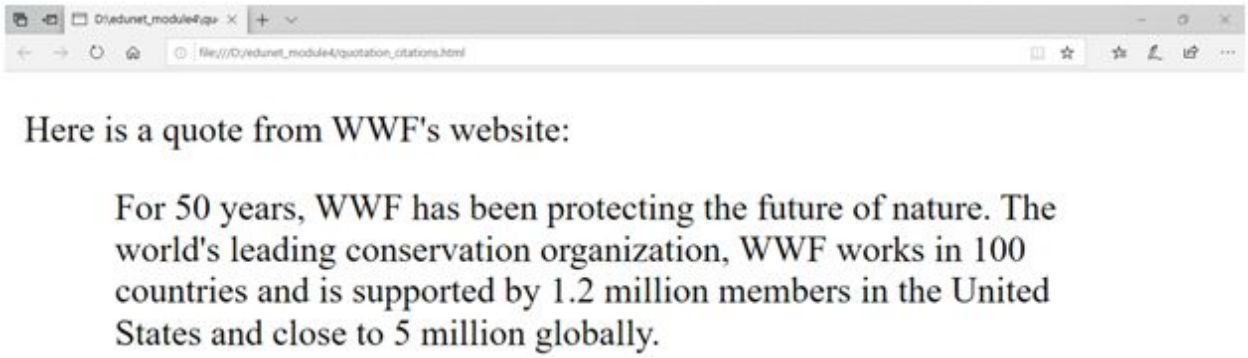
Here is a quote from WWF's website:
For 50 years, WWF has been protecting the future of nature. The world's leading conservation organization, WWF works in 100 countries and is supported by 1.2 million members in the United States and close to 5 million globally.

Image2: Add quotations and citations to web pages

References:

- https://www.geeksforgeeks.org/html-quotations/
- https://www.w3schools.com/html/html_quotation_elements.asp

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Activity 7

Aim: Embed a webpage within another webpage (2Hrs)

Learning outcome: Able to Structuring the web.

Duration: 2 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<iframe src="https://en.wikipedia.org/wiki/HTML">
  <p>Your browser does not support iframes.</p>
</iframe>
</body>
</html>
```

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Output/Results snippet:

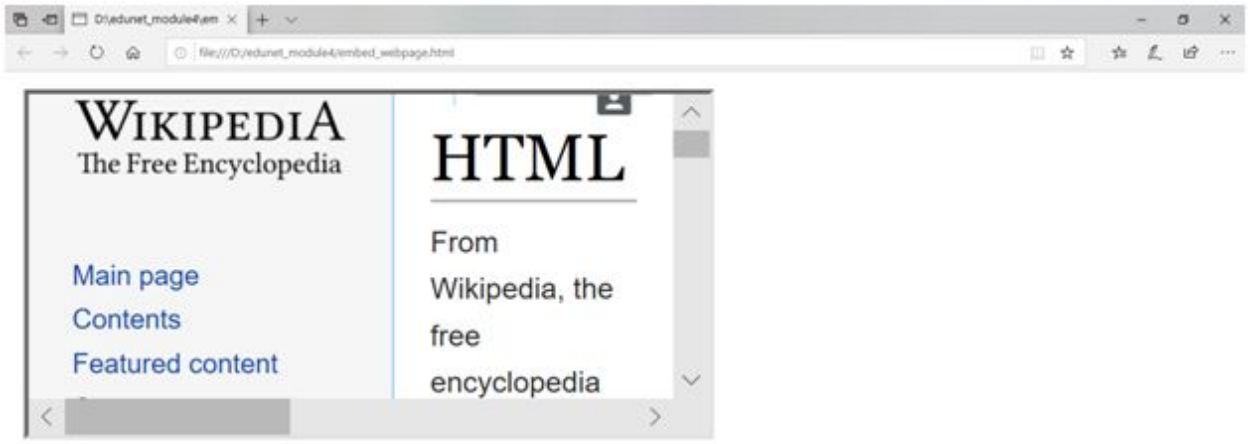

Image3: Embed a webpage within another webpage

References:

- https://atomisystems.com/html5-animation/embedding-html5-project-into-webpage/
- https://www.tutorialrepublic.com/html-tutorial/html-iframes.php

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Activity 8

Aim: Add Flash content within a webpage (3Hrs)

Learning outcome: Able to Structuring the web.

Duration: 3 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<embed src="helloworld.swf">
</body>
</html>
```

Output/Results snippet:

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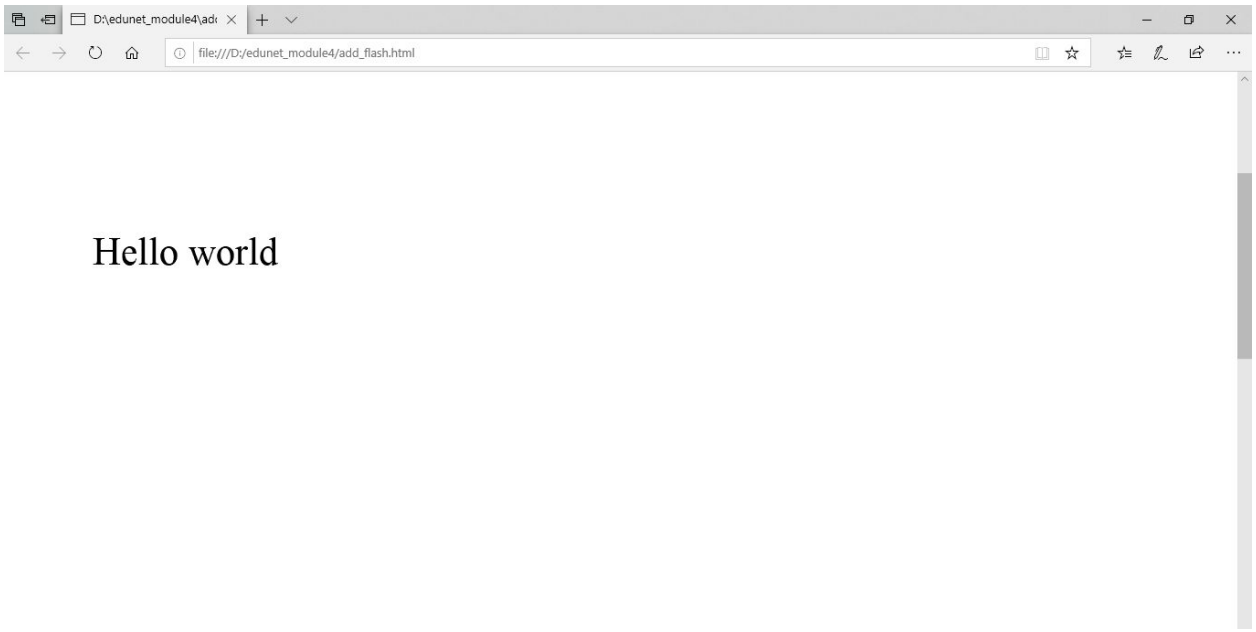

Image4: Add Flash content within a webpage

References:

- https://my.bluehost.com/hosting/help/flash-files
- https://www.inmotionhosting.com/support/website/inserting-flash-into-html/

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Activity 9

Aim: Create a data spreadsheet (2 Hrs)

Learning outcome: Able to Structuring the web.

Duration: 2 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>

<html>

<script type="text/javascript">

function createCSV() {

csvRows = [["label first","details of label 1"],["label sec","details of label 2"],["label 3","details of label 3"],["label 4","details of label 4 and 3"],["label 5","details of label 5"],["label 6","details of label 6"],["label 7","details of label 7"],["label 8","details of label 8"],["label 9","details of label 9"]];


var csvString = csvRows.join("%0A");

var a = document.createElement('a');

a.href = 'data:attachment/csv,' + csvString;
```

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```
a.target = '_blank';
a.download = 'myFile.csv';
document.body.appendChild(a);
a.click();

}
</script>
<body>
<form action="" method="post">
<input type="button" value="Create" >
</form>
</body>
</html>
```

Output/Results snippet:

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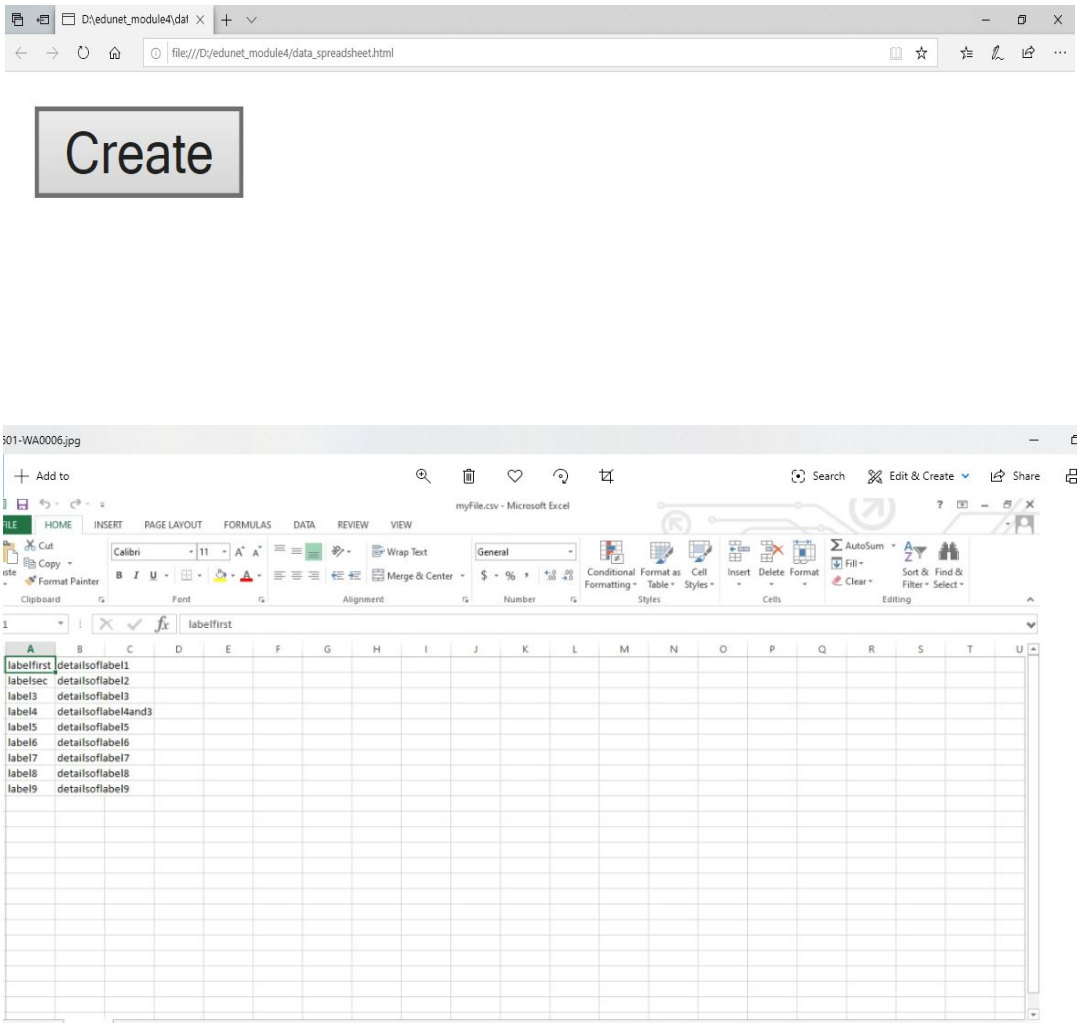

Image5: Create a data spreadsheet

References:

- https://www.codeproject.com/Questions/1116401/Insert-data-into-CSV-file-using-javascript
- https://stackoverflow.com/questions/22550858/how-to-write-csv-file-using-javascript

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Activity 10

Aim: Create HTML tables (1Hrs)

Learning outcome: Able to Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
table {
  font-family: arial, sans-serif;
  border-collapse: collapse;
  width: 100%;
}

td, th {
```

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```
  border: 1px solid #dddddd;
  text-align: left;
  padding: 8px;
}

tr:nth-child(even) {
  background-color: #dddddd;
}
</style>
</head>
<body>

<h2>HTML Table</h2>

<table>
  <tr>
    <th>Company</th>
    <th>Contact</th>
    <th>Country</th>
  </tr>
  <tr>
    <td>Alfreds Futterkiste</td>
```

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```
  <td>Maria Anders</td>
  <td>Germany</td>
</tr>
<tr>
  <td>Centro comercial Moctezuma</td>
  <td>Francisco Chang</td>
  <td>Mexico</td>
</tr>
<tr>
  <td>Ernst Handel</td>
  <td>Roland Mendel</td>
  <td>Austria</td>
</tr>
<tr>
  <td>Island Trading</td>
  <td>Helen Bennett</td>
  <td>UK</td>
</tr>
<tr>
  <td>Laughing Bacchus Winecellars</td>
  <td>Yoshi Tannamuri</td>
  <td>Canada</td>
```

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```
  </tr>
  <tr>
    <td>Magazzini Alimentari Riuniti</td>
    <td>Giovanni Rovelli</td>
    <td>Italy</td>
  </tr>
</table>

</body>
</html>
```

Output/Results snippet:

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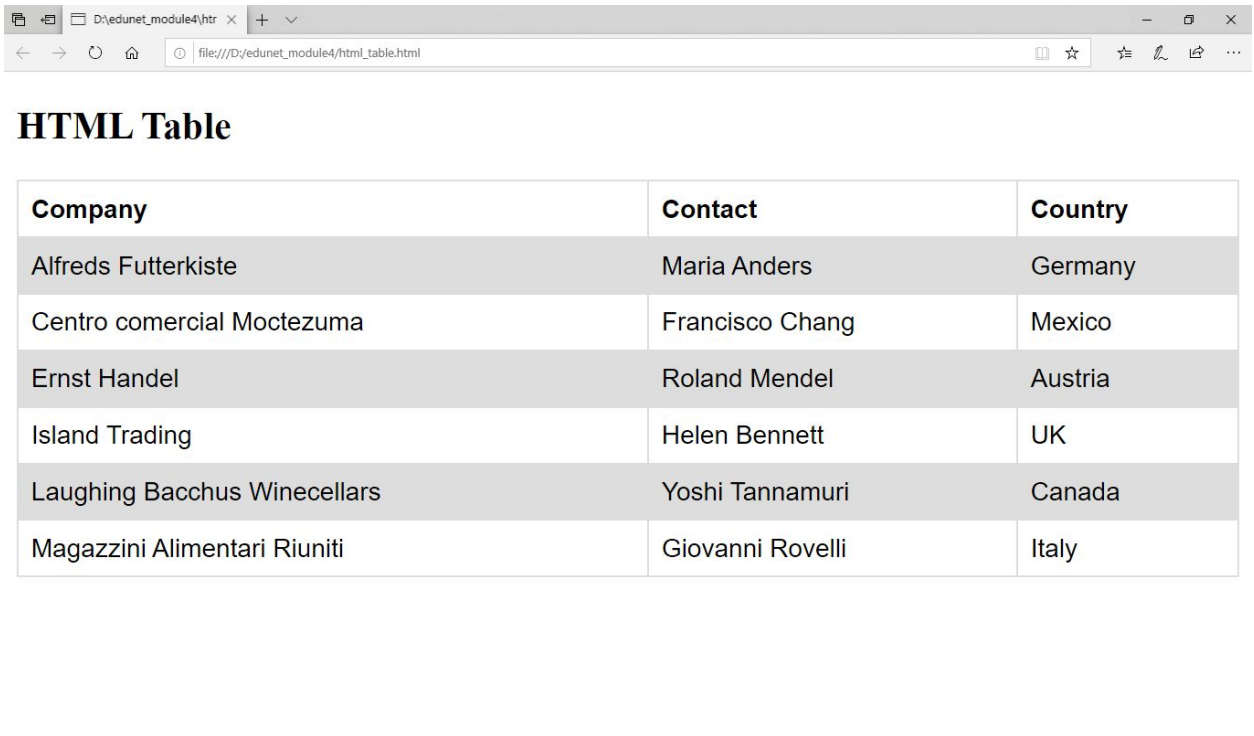

Image6: HTML Table

References:

- https://www.w3schools.com/html/html_tables.asp
- https://www.tutorialrepublic.com/html-tutorial/html-tables.php

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Activity 11

Aim: Optimize HTML table rendering (1Hr)

Learning outcome: Able to Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
table, th, td {
 border: 1px solid black;
}
</style>
</head>
<body>
<table>
```

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```
<tr>
<th>Month</th>
<th>Savings</th>
<th>Savings for holiday!</th>
</tr>
<tr>
<td>January</td>
<td>$100</td>
<td rowspan="2">$50</td>
</tr>
<tr>
<td>February</td>
<td>$80</td>
</tr>
</table>
</body>
</html>
```

Output/Results snippet:

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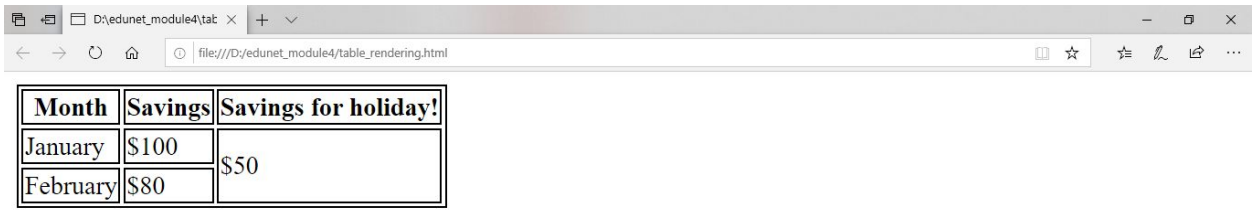

Image7: Optimize HTML table rendering

References:

- https://stackoverflow.com/questions/21531269/optimizing-html-tables
- https://seymour.co.za/2017/07/03/html-table/

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Activity 12

Aim: Create collapsible content with HTML (1Hr)

Learning outcome: Able to Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<style>
.collapsible {
 background-color: #777;
 color: white;
 cursor: pointer;
 padding: 18px;
 width: 100%;
```

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```
 border: none;
 text-align: left;
 outline: none;
 font-size: 15px;
}
.active, .collapsible:hover {
 background-color: #555;
}
.content {
 padding: 0 18px;
 display: none;
overflow: hidden;
 background-color: #f1f1f1;
}
</style>
</head>
<body>
<h2>Collapsibles</h2>
<p>A Collapsible:</p>
<button class="collapsible">Open Collapsible</button>
<div class="content">
<p>Data 1.</p>
```

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```
</div>
<p>Collapsible Set:</p>
<button class="collapsible">Open Section 1</button>
<div class="content">
 <p>Data 2.</p>
</div>
<button class="collapsible">Open Section 2</button>
<div class="content">
 <p>Data 3.</p>
</div>
<button class="collapsible">Open Section 3</button>
<div class="content">
 <p>Data 4.</p>
</div>
<script>
var coll = document.getElementsByClassName("collapsible");
var i;
for (i = 0; i < coll.length; i++) {
 coll[i].addEventListener("click", function() {
 this.classList.toggle("active");
 var content = this.nextElementSibling;
 if (content.style.display === "block") {
```

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```
content.style.display = "none";
} else {
content.style.display = "block";
}
});
}
</script>
</body>
</html>
```

Output/Results snippet:

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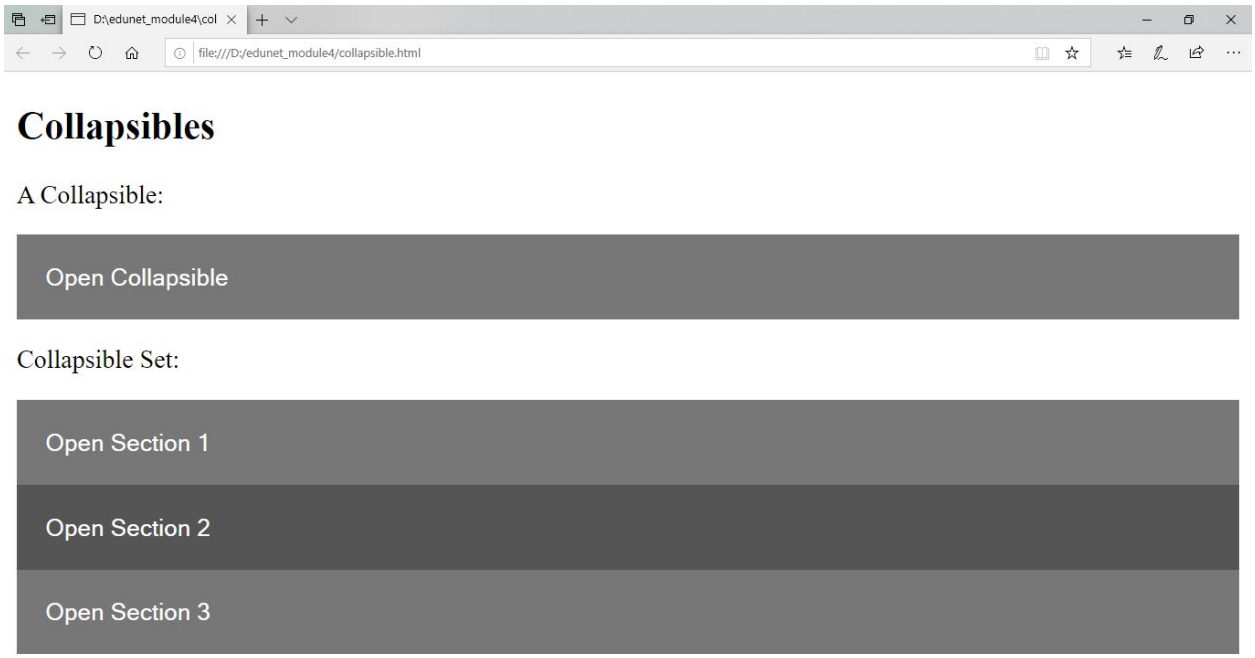

Image8: Create collapsible content with HTML

References:

<Include at least 1 reference per activity where students can go and explore. Remove this part from your final document.>

- https://www.w3schools.com/bootstrap/bootstrap_collapse.asp
- https://www.w3schools.com/howto/howto_js_collapsible.asp

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Activity 13

Aim: Add context menus to a webpage (2Hr)

Learning outcome: Able to Structuring the web.

Duration: 2 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<p>The <abbr title="World Health Organization">WHO</abbr> was founded in 1948.</p>
</body>
</html>
```

Output/Results snippet:

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Image 9: Add context menus to a webpage

References:

- https://stackoverflow.com/questions/4909167/how-to-add-a-custom-right-click-menu-to-a-webpage
- https://www.w3schools.com/jsref/event_oncontextmenu.asp

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Activity 14

Aim: Create dialog boxes with HTML (2Hrs)

Learning outcome: Able to Structuring the web.

Duration: 2 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<style>
body {font-family: Arial, Helvetica, sans-serif;}
/* The Modal (background) */
.modal {
 display: none; /* Hidden by default */
 position: fixed; /* Stay in place */
 z-index: 1; /* Sit on top */
```

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```
 padding-top: 100px; /* Location of the box */
 left: 0;
 top: 0;
 width: 100%; /* Full width */
 height: 100%; /* Full height */
 overflow: auto; /* Enable scroll if needed */
 background-color: rgb(0,0,0); /* Fallback color */
 background-color: rgba(0,0,0,0.4); /* Black w/ opacity */
}
/* Modal Content */
.modal-content {
 background-color: #fefefe;
 margin: auto;
 padding: 20px;
 border: 1px solid #888;
 width: 80%;
}
/* The Close Button */
.close {
 color: #aaaaaa;
 float: right;
 font-size: 28px;
```

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```
 font-weight: bold;
}
.close:hover,
.close:focus {
 color: #000;
 text-decoration: none;
 cursor: pointer;
}
</style>
</head>
<body>
<h2>Modal Example</h2>
<!-- Trigger/Open The Modal -->
<button id="myBtn">Open Modal</button>
<!-- The Modal -->
<div id="myModal" class="modal">
 <!-- Modal content -->
 <div class="modal-content">
 <span class="close">&times;</span>
 <p>Some text in the Modal..</p>
 </div>
</div>
```

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```
<script>
// Get the modal
var modal = document.getElementById('myModal');
// Get the button that opens the modal
var btn = document.getElementById("myBtn");
// Get the <span> element that closes the modal
var span = document.getElementsByClassName("close")[0];
// When the user clicks the button, open the modal
btn.onclick = function() {
 modal.style.display = "block";
}
// When the user clicks on <span> (x), close the modal
span.onclick = function() {
 modal.style.display = "none";
}
// When the user clicks anywhere outside of the modal, close it
window.onclick = function(event) {
 if (event.target == modal) {
 modal.style.display = "none";
 }
}
</script>
```

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</body>

</html>

Output/Results snippet:

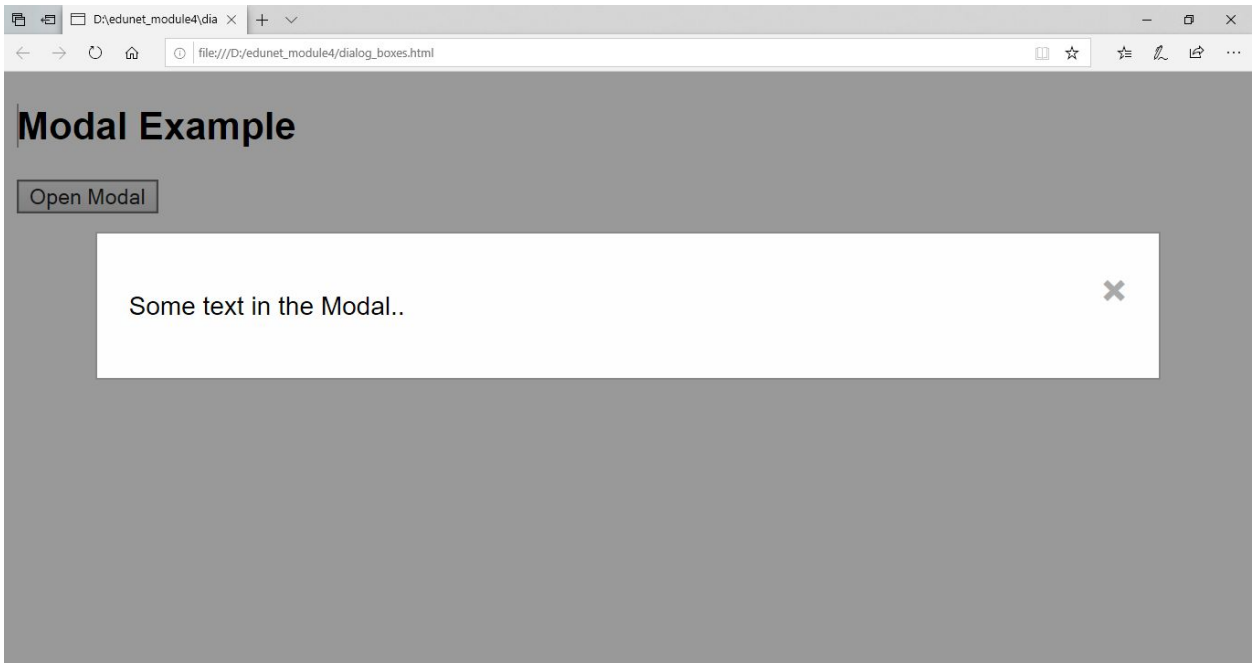

Image10: Create dialog boxes with HTML

References:

- https://www.javatpoint.com/html-dialog-tag
- https://www.w3schools.com/tags/tag_dialog.asp

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Activity 15

Aim: Add multiple languages into a single webpage (2Hrs)

Learning outcome: Able to Structuring the web.

Duration: 2 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<!doctype html>
<html lang="en">
<head>
<meta charset="utf-8">
<title>jQuery Language Switcher</title>
<link rel="stylesheet" href="languageswitcher.css">
</head>
<body>
<header>
<h1>jQuery Language Switcher</h1>
```

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```
<div id="country-select">
 <form action="server-side-script.php">
 <select id="country-options" name="country-options">
 <option selected="selected" title="http://www.yoursite.com" value="us">United
States</option>
 <option title="http://www.yoursite.co.uk" value="uk">United Kingdom</option>
 <option title="http://www.yoursite.fr" value="fr">France</option>
 <option title="http://www.yoursite.de" value="de">Germany</option>
 <option title="http://www.yoursite.nl" value="nl">Netherlands</option>
 </select>
 <input value="Select" type="submit" />
 </form>
</div>
</header>
<section>
<p>For more information, refer to the <a
href="/website-language-dropdown-withjquery">original article</a> on graphicpush.</p>
</section>
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.5.0/jquery.min.js"></script>
<script src="languageswitcher.js"></script>
</body>
</html>
```

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languageswitcher.css

```
* { margin: 0; padding: 0; }
body {
background: #ccc;
}
header {
display: block;
background: #777;
height: 50px;
position: relative;
min-width: 600px;
}
header h1 {
font: bold 24px Arial, Helvetica, sans-serif;
color: #fff;
position: absolute;
left: 20px;
top: 8px;
}
#country-select {
position: absolute;
```

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```
top: 13px;
right: 0;
width: 180px;
}
/* rought form styles for when JS is disabled */
#country-select form {
width: 180px;
padding: 0;
}
#country-select select,
#country-select input {
display: inline;
padding: 0;
margin: 0;
}
/* JS-created definition list */
.dropdown dd { position: relative; }
.dropdown a {
text-decoration: none;
outline: 0;
font: 12px Arial, Helvetica, sans-serif;
display: block;
```

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```
width: 130px;
overflow: hidden;
}
.dropdown dt a {
background: #c45618;
border: 1px solid #964315;
padding: 3px 10px 4px 10px;
-webkit-border-radius: 5px;
-moz-border-radius: 5px;
border-radius: 5px;
color: #fff;
}
.dropdown dt a.active {
background: #db5e18;
-webkit-border-bottom-left-radius: 0;
-webkit-border-bottom-right-radius: 0;
-moz-border-radius-bottomleft: 0;
-moz-border-radius-bottomright: 0;
border-bottom-left-radius: 0;
border-bottom-right-radius: 0;
border-bottom: 1px dotted #676768;
-moz-box-shadow: 0 3px 7px rgba(0,0,0,.5);
```

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```
-webkit-box-shadow: 0 3px 7px rgba(0,0,0,.5);
box-shadow: 0 3px 7px rgba(0,0,0,.5);
color: #fff;
}
.dropdown dd ul {
background: #814f33;
border: 1px solid #676768;
color: #C5C0B0;
display: none;
position: absolute;
z-index: 999;
top: 0;
left: 0;
padding: 2px 0 5px 0;
list-style: none;
border-top: none;
margin: 0;
-webkit-border-bottom-right-radius: 5px;
-webkit-border-bottom-left-radius: 5px;
-moz-border-radius-bottomright: 5px;
-moz-border-radius-bottomleft: 5px;
border-bottom-right-radius: 5px;
```

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```
border-bottom-left-radius: 5px;
-moz-box-shadow: 0 3px 7px rgba(0,0,0,.5);
-webkit-box-shadow: 0 3px 7px rgba(0,0,0,.5);
box-shadow: 0 3px 7px rgba(0,0,0,.5);
}
.dropdown dd ul li a {
padding: 2px 10px;
}
.dropdown dd ul li a span,
.dropdown dt a span {
float: left;
width: 16px;
height: 11px;
margin: 2px 6px 0 0;
background-image: url(flags.png);
background-repeat: no-repeat;
cursor: pointer;
}
.us a span { background-position: 0 0 }
.uk a span { background-position: -16px 0 }
.fr a span { background-position: -32px 0 }
.de a span { background-position: -48px 0 }
```

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```
.nl a span { background-position: -64px 0 }
.dropdown dd ul li a em,
.dropdown dt a em {
font-style: normal;
float: left;
width: 100px;
cursor: pointer;
}
.dropdown dd ul li a em {
color: #dbc3b5;
}
.dropdown dd ul li a:hover { background-color: rgba(255,255,255,.1); }
.dropdown dd ul li a:hover em { color: #fff; }
```

Languageswitcher.js

```
$(document).ready(function() {
// --- language dropdown --- //
// turn select into dl
createDropDown();
var $dropTrigger = $(".dropdown dt a");
var $languageList = $(".dropdown dd ul");
// open and close list when button is clicked
$dropTrigger.toggle(function() {
```

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```
$languageList.slideDown(200);
$dropTrigger.addClass("active");
}, function() {
$languageList.slideUp(200);
$(this).removeAttr("class");
});
// close list when anywhere else on the screen is clicked
$(document).bind('click', function(e) {
var $clicked = $(e.target);
if (! $clicked.parents().hasClass("dropdown"))
$languageList.slideUp(200);
$dropTrigger.removeAttr("class");
});
// when a language is clicked, make the selection and then hide the list
$(".dropdown dd ul li a").click(function() {
var clickedValue = $(this).parent().attr("class");
var clickedTitle = $(this).find("em").html();
$("#target dt").removeClass().addClass(clickedValue);
$("#target dt em").html(clickedTitle);
$languageList.hide();
$dropTrigger.removeAttr("class");
});
```

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```
});
// actual function to transform select to definition list
function createDropDown(){
var $form = $("div#country-select form");
 $form.hide();
var source = $("#country-options");
source.removeAttr("autocomplete");
var selected = source.find("option:selected");
var options = $("option", source);
$("#country-select").append('<dl id="target" class="dropdown"></dl>')
$("#target").append('<dt class="' + selected.val() + '"><a href="#"><span
class="flag"></span><em>' + selected.text() + '</em></a></dt>')
$("#target").append('<dd><ul></ul></dd>')
options.each(function(){
$("#target dd ul").append('<li class="' + $(this).val() + '"><a href="' + $(this).attr("title") +
'"><span class="flag"></span><em>' + $(this).text() + '</em></a></li>');
});
}
```

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Output/Results snippet:

Image11: Add multiple languages into a single webpage

References:

- https://stackoverflow.com/questions/46008760/how-to-build-multiple-language-website-using-pure-html-js-jquery
- https://www.freecodecamp.org/forum/t/what-is-the-best-way-to-create-a-multi-language-site/99449

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Activity 16

Aim: Controlling of HTML line breaking (1Hrs)

Learning outcome: Able to Structuring the web.

Duration: 1 hour

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. Text Editor- Sublime Text ,Notepad++
3. Browser

Code/Program/Procedure (with comments):

```
<p> O’er all the hilltops<br>
   Is quiet now,<br>
   In all the treetops<br>
   Hearest thou<br>
   Hardly a breath;<br>
   The birds are asleep in the trees:<br>
   Wait, soon like these<br>
   Thou too shalt rest.
</p>
```

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Output/Results snippet:

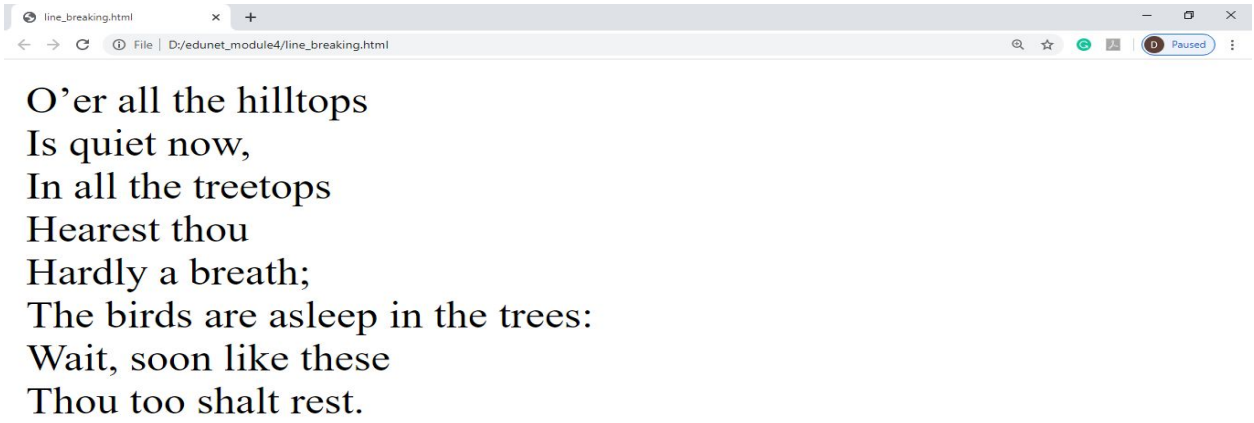

Image12: Controlling of HTML line breaking

References:

- https://www.informit.com/articles/article.aspx?p=131028&seqNum=7
- https://developer.mozilla.org/en-US/docs/Web/HTML/Element/br

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Activity 17

Aim: Mark changes (added and removed text) (2Hrs)

Learning outcome: Able to structure the web.

Duration: 35 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<h2>HTML <mark>Marked</mark> Formatting</h2>
<p>The ins element represent inserted (added) text.</p>
<p>My favorite <ins>color</ins> is red.</p>
<p>The del element represents deleted (removed) text.</p>
<p>My favorite color is <del>blue</del> red.</p>
</body>
</html>
```

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Output/Results snippet:

HTML Marked Formatting

The ins element represent inserted (added) text.

My favorite color is red.

The del element represents deleted (removed) text.

My favorite color is blue red.

References:

- https://www.w3schools.com/tags/tag_del.asp

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Activity 18

Aim: Add responsive image to a webpage (3Hrs)

Learning outcome: Able to structure the web.

Duration: 35 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<style>
.responsive {                    /*creating a class in css and setting rules */
width: 100%;
max-width: 400px;
height: auto;
}
</style>
```

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```
</head>
<body>
<h2>Responsive Images</h2>
<p>If you want the image to scale both up and down on responsiveness, set the CSS width
property to 100% and height to auto.</p>
<p>Resize the browser window to see the effect.</p>
<img src="flower.jpg" alt="Nature" class="responsive" width="600" height="400">
</body>          <!-- import the image and apply the css class effects -- >
</html>
```

Output/Results snippet:

Responsive Images
If you want the image to scale both up and down on responsiveness, set the CSS width property to 100% and height to auto.
Resize the browser window to see the effect.

References:

- https://www.w3schools.com/howto/howto_css_image_responsive.asp

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Activity 19

Aim: Add vector image to a webpage (3Hrs)

Learning outcome: Able to structure the web.

Duration: 35 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<html>
<body>
<svg width="100" height="100">      <!-- <svg> is a container for svg graphics -->
<circle cx="50" cy="50" r="40" stroke="green" stroke-width="4" fill="yellow" />
Sorry, your browser does not support inline SVG.
                                    <!-- if circle is not displayed then this text will show -->
</svg>
</body>
</html>
```

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Output/Results snippet:

References:

- https://www.w3schools.com/html/html5_svg.asp

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Activity 20

Aim: Add a hit map on top of an image (2Hrs)

Learning outcome: Able to structure the web.

Duration: 35 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<p>Click on the sun or on one of the planets to watch it closer:</p>
<img src="planets.gif" width="145" height="126" alt="Planets" usemap="#planetmap">
<map name="planetmap">
<area shape="rect" coords="0,0,82,126" alt="Sun" href="sun.htm">
<area shape="circle" coords="90,58,3" alt="Mercury" href="mercur.htm">
<area shape="circle" coords="124,58,8" alt="Venus" href="venus.htm">
</map>
</body>
```

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</html>

Output/Results snippet:

References:

- https://www.w3schools.com/tags/tag_map.asp

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Learning Outcome 3 - Able to understand Scripting and styling the web

After achieving this learning outcome, a student will be able to understand structuring the web. In order to achieve this learning outcome, a student has to complete the following:

1. Apply CSS within a webpage (2Hrs)
2. Apply CSS to HTML (3 Hrs)
3. Select elements via element name, class or ID (2 Hrs)
4. Select elements via attribute name and content (1 Hrs)
5. Apply pseudo-elements (2 Hrs)
6. Specify colors in CSS (2 Hrs)
7. Debug CSS in the browser (1 Hrs)
8. Style text and customize a list of elements (2Hrs)
9. Add shadows to text (2 Hrs)
10. Size CSS boxes (2Hrs)
11. Control overflowing content (1 Hr)
12. Control the part of a CSS box to draw the background (2 Hrs)
13. Create fancy boxes (also see the Styling boxes module, generally). (2Hrs)
14. Use background-clip to control background image (1Hrs)
15. Change the box model completely using box- sizing (2Hrs)
16. Control backgrounds (3 Hrs)
17. Apply control borders(2Hrs)
18. Style an HTML table (3 Hrs)
19. Add shadows to boxes (2 Hrs)
20. Calculate specificity of a CSS selector (3Hrs)
21. Control inheritance in CSS (2 Hrs)
22. Apply filters in CSS (2Hrs)
23. Apply blend modes in CSS (1Hr)
24. Apply CSS multi-column layouts (3Hrs)
25. Apply CSS generated content (2Hrs)

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Activity 1

Aim: Apply CSS within a webpage (2Hrs)

Learning outcome: Able to script and style the web.

Duration: 50 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
body {background-color: powderblue;}        /* setting background color for body element */
h1 {color: blue;}                  /* setting color for h1 element */
p {color: red;}                    /* setting color for paragraph element */
</style>
</head>
<body>
<h1>This is a heading</h1>
```

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This is a paragraph.

</body>

</html>

Output/Results snippet:

References:

- https://www.w3schools.com/html/html_css.asp

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Activity 2

Aim: Apply CSS to HTML

Learning outcome: Able to script and style the web.

Duration: 50 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<link rel="stylesheet" href="style.css">        <!-- Linking the external .css file to this html doc-->
</head>
<body>
<h1>This is a heading</h1>
<p>This is a paragraph.</p>
</body>
</html>
```

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style.css

```
/* here only the css rules are coded and this file need to be imported in html file for use */
body {
background-color: powderblue;
}
h1 {
color: blue;
}
p {
color: red;
}
```

Output/Results snippet:

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References:

- https://www.w3schools.com/html/html_css.asp

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Activity 3

Aim: Select elements via element name, class or ID (2 Hrs)

Learning outcome: Able to script and style the web.

Duration: 50 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
.center {                    /* setting the css rules for center class */
text-align: center;
color: red;
}
</style>
</head>
<body>
```

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<h1 class="center">Red and center-aligned heading</h1> /*applying the effect of class center*/

Red and center-aligned paragraph. /*applying the effect of class center*/

</body>

</html>

Output/Results snippet:

References:

- https://www.w3schools.com/css/css_selectors.asp

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Activity 4

Aim: Select elements via attribute name and content (1 Hrs)

Learning outcome: Able to script and style the web.

Duration: 50 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
input[type="text"] {            /* sets the css rule for textbox element*/
width: 150px;
display: block;
margin-bottom: 10px;
background-color: yellow;
}
```

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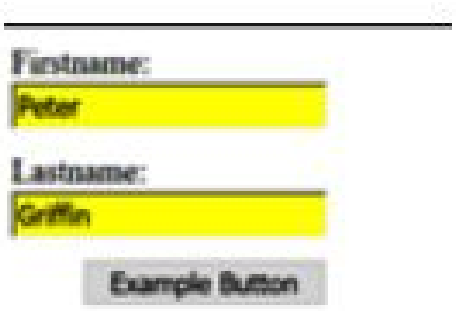
```
input[type="button"] {          /* sets the css rule for button element*/
width: 120px;
margin-left: 35px;
display: block;
}
</style>
</head>
<body>
<form name="input" action="" method="get">
Firstname:<input type="text" name="Name" value="Peter" size="20">
Lastname:<input type="text" name="Name" value="Griffin" size="20">
```

Output/Results snippet:



References:

- https://www.w3schools.com/css/css_attribute_selectors.asp

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Activity 5

Aim: Apply pseudo-elements (2 Hrs)

Learning outcome: Able to script and style the web.

Duration: 50 hours

List of Hardware/Software requirements:

1. A computer with Windows/Linux/Mac operating system.
2. Any latest browser installed.
3. Any HTML editor (online/pre-installed).

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
p.intro::first-letter {          /* sets the css rule of intro class for its first-letter */
color: #ff0000;
font-size:200%;
}
</style>
```

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```
</head>
<body>
<p class="intro">This is an introduction.</p>          /*applying the effects of intro class*/
<p>This is a paragraph with some text. A bit more text even.</p>
</body>
</html>
```

Output/Results snippet:

References:

- https://www.w3schools.com/css/css_pseudo_elements.asp

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Activity 6

Aim: Specify colors in CSS (5 Hrs)

Learning outcome: Specify colors in CSS.

Duration: 2 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8">
    <title>CSS Color</title>
    <style>
        /* Using Color Name */
        #col {
            color: red;
        }
        /* Using Hexadecimal Color code */
        #hex {
            color: #00ff00;
        }
        /* Using RGB() */
        #rgb {
            color: rgb(255, 165, 0);
        }
        /* Using RGBA() */
        #rgba {
            color: rgba(255, 0, 0, 1);
```

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```
        }
        /* Using HSLA */
        #hsla {
            color: hsla(120, 100%, 25%, 0.3);
        }
    </style>
</head>
<body>
    <p id="col">Specify Colors in CSS using Color Names</h1>
    <p id ="hex">Specify Colors in CSS using Hexadecimal Notation</p>
    <p id = "rgb">Specify Colors in CSS using RGB Values</h2>
    <p id="rgba">Specify Colors in CSS using rgba() Values</p>
    <p id="hsla">Specify Colors in CSS using HSLA() Values</p>
</body>
</html>
```

Output/Results snippet:

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CSS Color
file:///D:/Edunet/Module4 Lab/Ex1.html
Specify Colors in CSS using Color Names
Specify Colors in CSS using Hexadecimal Notation
Specify Colors in CSS using RGB Values
Specify Colors in CSS using rgba() Values
Specify Colors in CSS using HSLA() Values

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 7

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Debug CSS in the browser.

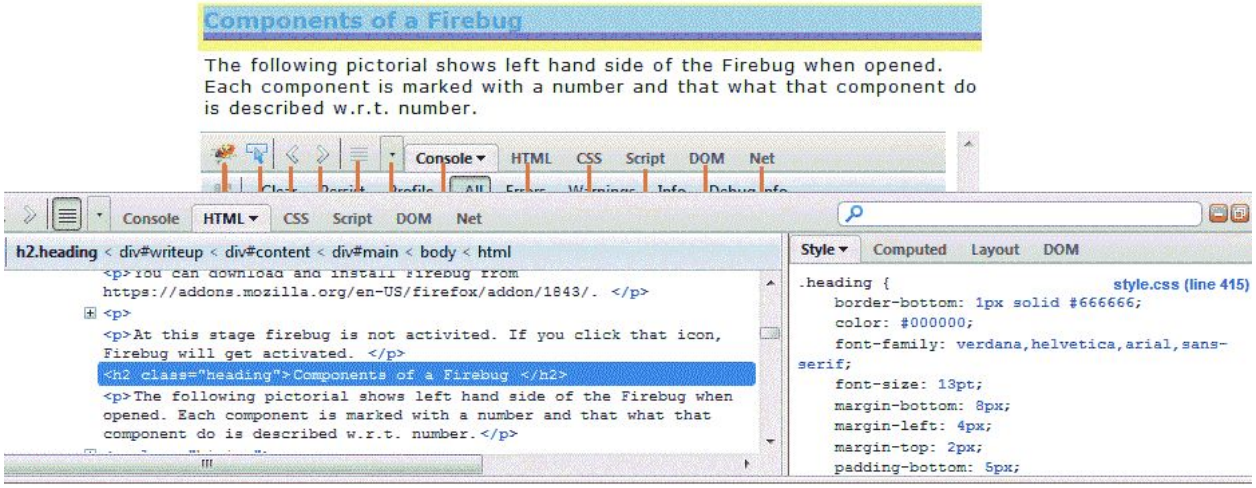
Duration: 1 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser, Mozilla Firefox recommended.

Code/Program/Procedure (with comments):

- Right click on the element which you want to inspect and click on the **Inspect Element**.


Components of a Firebug
The following pictorial shows left hand side of the Firebug when opened. Each component is marked with a number and that what that component do is described w.r.t. number.
Console
HTML
CSS
Script
DOM
Net
h2.heading < div#writeup < div#content < div#main < body < html
https://addons.mozilla.org/en-US/firefox/addon/1843/.
At this stage firebug is not activited. If you click that icon, Firebug will get activated.
<h2 class="heading">Components of a Firebug </h2>
The following pictorial shows left hand side of the Firebug when opened. Each component is marked with a number and that what that component do is described w.r.t. number.
Style
Computed
Layout
DOM
.heading {
style.css (line 415)
border-bottom: 1px solid #666666;
color: #000000;
font-family: verdana,helvetica,arial,sans-serif;
font-size: 13pt;
margin-bottom: 8px;
margin-left: 4px;
margin-top: 2px;
padding-bottom: 5px;

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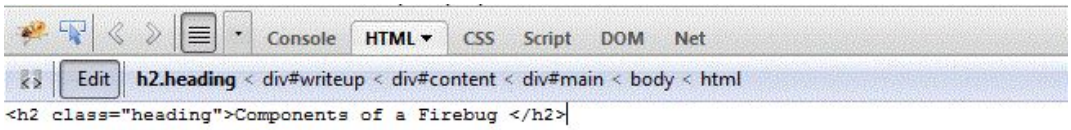
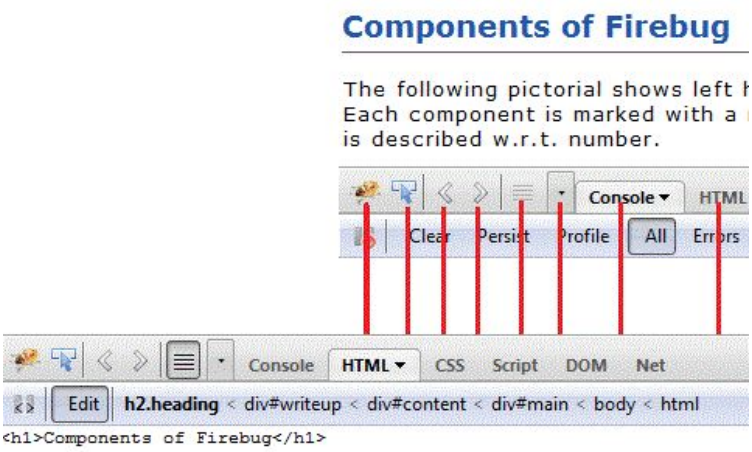
- Click on the **Edit** in the Firebug window now.



- Change the code to <h1>Components of Firebug</h1> .



As soon as you change the code, you can see the effect live. You can copy the code and then simply paste it replacing the original code and save to make the effect permanent.

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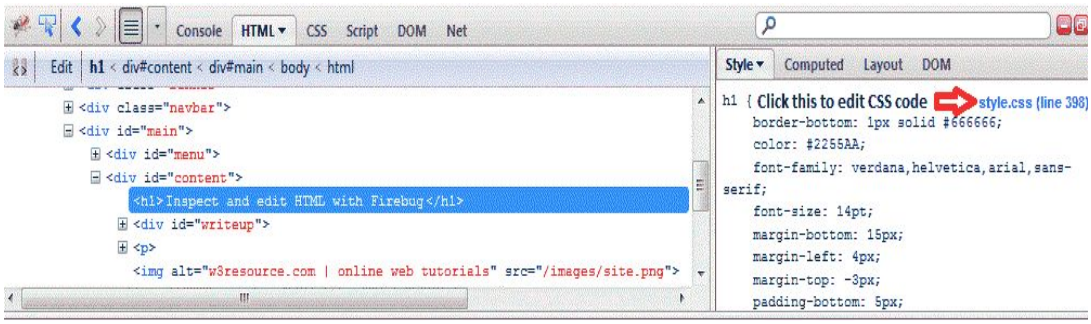
Inspect and edit CSS with Firebug

- Right click on the element which you want to inspect and click on the **Inspect Element**. A then click as shown (scroll the image to right) in the image to open corresponding CSS code.



- Change the color of the heading by changing the code to colour: red;
- You will see the effect live immediately. Now you can simple copy this and replace the original code and save to make the changes permanent

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Output/Results snippet:

- Edit and save successfully.

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS
- https://developer.mozilla.org/en-US/docs/Tools/Page_Inspector/How_to/Examine_and_edit_HTML

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Activity 8

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Style text and customize a list of elements.

Duration: 2 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>

<head>
    <title>CSS Text Color</title>
    <style>
        /* Text Properties*/
        #txt {
            text-align: justify;
            text-indent: 35px;
            text-transform: capitalize;
            letter-spacing: 5px;
            word-spacing: 25px;
            white-space: pre;
            text-shadow: 4px 4px 8px orange;
            font-style: italic;
        }
        /* Unorderd List*/
        ul.unol1 {
            list-style-type: circle;
        }
```

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```
        ul.unol2 {
            list-style-type: square;
        }
        /* Orderd List */
        ol.ol1 {
            list-style-type: upper-roman;
        }

        ol.ol2 {
            list-style-type: lower-alpha;
        }
    </style>
</head>

<body>
    <p id="txt">
        Hello, this is example of CSS text-align justify type.
        Its like newspaper or book type.
    </p>
    <p>Example of UnOrdered lists:</p>
    <ul class="unol1">
        <li>HTML5</li>
        <li>CSS3</li>
        <li>JAVASCRIPT</li>
    </ul>

    <ul class="unol2">
        <li>Typescript</li>
        <li>Bootstrap</li>
        <li>JQuery</li>
    </ul>
    <p>Example of ordered lists:</p>
    <ol class="ol1">
        <li>C</li>
```

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```
        <li>Java</li>
        <li>Python</li>
    </ol>
    <ol class="ol2">
        <li>Mozila firefox</li>
        <li>Chromium</li>
        <li>EPIC</li>
    </ol>
</body>

</html>
```

Output/Results snippet:

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References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 9

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Add shadows to text.

Duration: 2 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<title>CSS Text Shadow Effect</title>
<style>
/* CSS Text Shadow Effect */
    p{
        font: 26px sans-serif;
    }
    p.shadow{
        text-shadow: 1px 1px 2px rgba(0, 0, 0, 0.6);
    }
    p.shadow-multiple{
        text-shadow: 2px 2px 3px yellow, 3px 3px 5px red;
    }
    p.shadow-outline{
        color: #fff;
        text-shadow: -1px 0 #000, 0 1px #000, 1px 0 #000, 0 -1px #000;
    }
</style>
```

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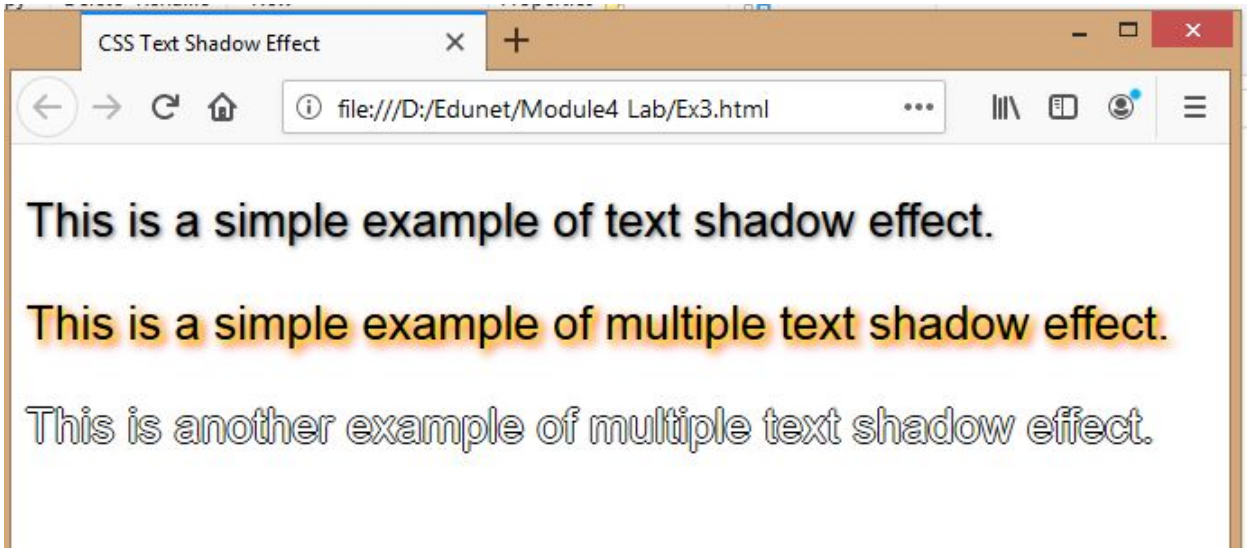
```
</head>
<body>
    <p class="shadow">This is a simple example of text shadow effect.<
/p>
    <p class="shadow-multiple">This is a simple example of multiple te
xt shadow effect.</p>
    <p class="shadow-outline">this is another example of multiple text
 shadow effect. </p>
</body>
</html>
```

Output/Results snippet:


CSS Text Shadow Effect
file:///D:/Edunet/Module4 Lab/Ex3.html
This is a simple example of text shadow effect.
This is a simple example of multiple text shadow effect.
This is another example of multiple text shadow effect.

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 10

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Size CSS boxes.

Duration: 2 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
/* CSS Box Properties */
#example1 {
  border: 10px dashed black;
  padding: 25px;
  background: url(edu.jpg);
  background-repeat: no-repeat;
  background-origin: content-box, padding-box;
}

#example2 {
  border: 10px dashed black;
  padding: 25px;
  background: url(edu.jpg);
  background-repeat: no-repeat;
  background-origin: content-box, border-box;
}
```

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```
#example3 {
  border: 10px dashed black;
  padding: 25px;
  background: url(edu.jpg);
  background-repeat: no-repeat;
  background-origin: content-box, content-box;
}
</style>
</head>
<body>
<h2>background-origin: content-box, padding-box:</h2>
<div id="example1">
  <h2>Hello World</h2>
  <p>The "edu.jpg" background image starts from the upper left corner
of the padding edge.</p>
  <p>The "edu.jpg" background image starts from the upper left corner
of the content.</p>
</div>
<h2>background-origin: content-box, border-box:</h2>
<div id="example2">
  <h2>Hello World</h2>
  <p>The "edu.jpg" background image starts from the upper left corner
of the border.</p>
  <p>The "edu.jpg" background image starts from the upper left corner
of the content.</p>
</div>
<h2>background-origin: content-box, content-box:</h2>
<div id="example3">
  <h2>Hello World</h2>
  <p>Both background images starts from the upper left corner of the c
ontent.</p>
</div>
</body>
</html>
```

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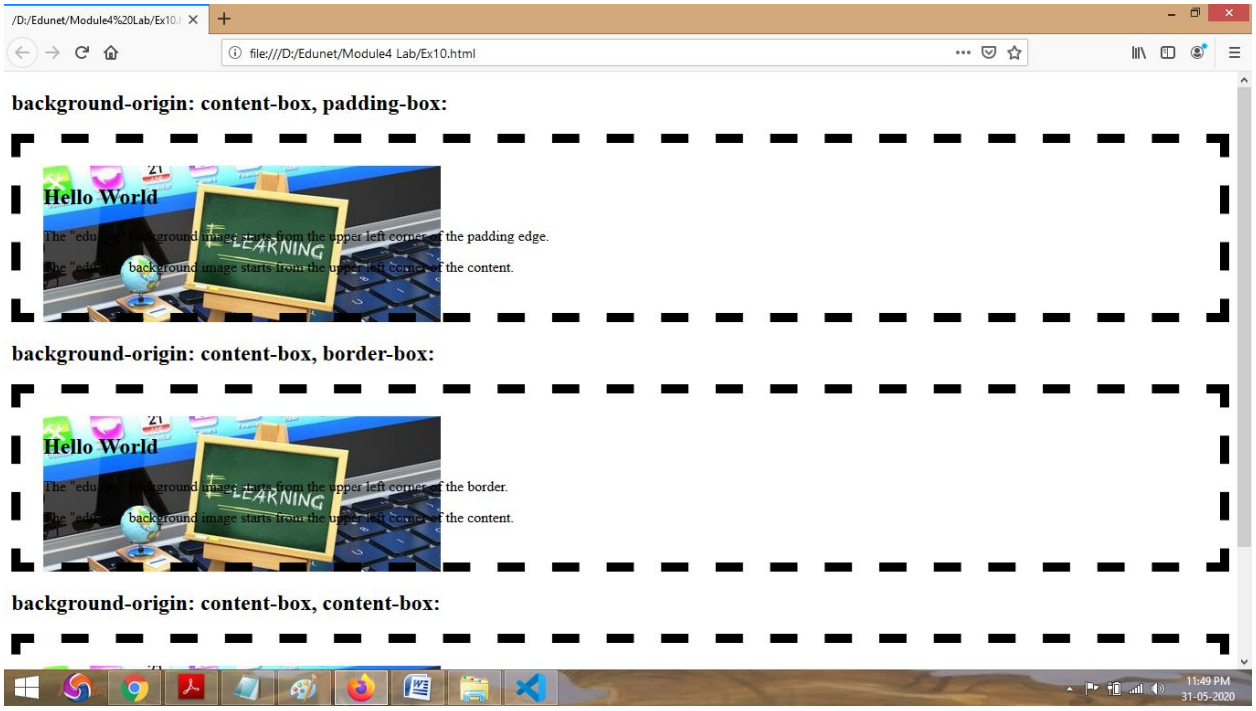
Output/Results snippet:



References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 11

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Control overflowing content.

Duration: 1 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
    <style>
/* Overflow – Visible, Hidden, Scroll, Auto */
        #overflow-visible {
            background-color: #cccccc;
            width: 200px;
            height: 50px;
            border: 2px solid red;
            overflow: visible;
        }
        #overflow-hidden {
            background-color: #cccccc;
            width: 200px;
            height: 50px;
            border: 1px solid red;
            overflow: hidden;
        }

        #overflow-scroll {
```

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```
            background-color: #cccccc;
            width: 200px;
            height: 50px;
            border: 1px solid red;
            overflow: scroll;
        }
        #overflow-auto {
            background-color: #cccccc;
            width: 200px;
            height: 50px;
            border: 1px solid red;
            overflow: auto;
        }
    </style>
</head>

<body>

    <h2>This is CSS Overflow!</h2>
    <p>See the extra content visible out of the element.</p>
    <div id="overflow-visible">overflow-visible. </div>
    <h2>This is CSS Overflow (hidden)!</h2>
    <p>See the extra content out of the element?</p>
    <div id="overflow-hidden">overflow-hidden.</div>
    <h2>This is CSS Overflow (scroll)!</h2>
    <p>See a new scroll bar?</p>
    <div id="overflow-scroll">overflow-scroll</div>
    <h2>This is CSS Overflow (scroll)!</h2>
    <p>See a new vertical scroll bar?</p>
    <div id="overflow-auto">overflow-auto</div>
</body>
</html>
```

Output/Results snippet:

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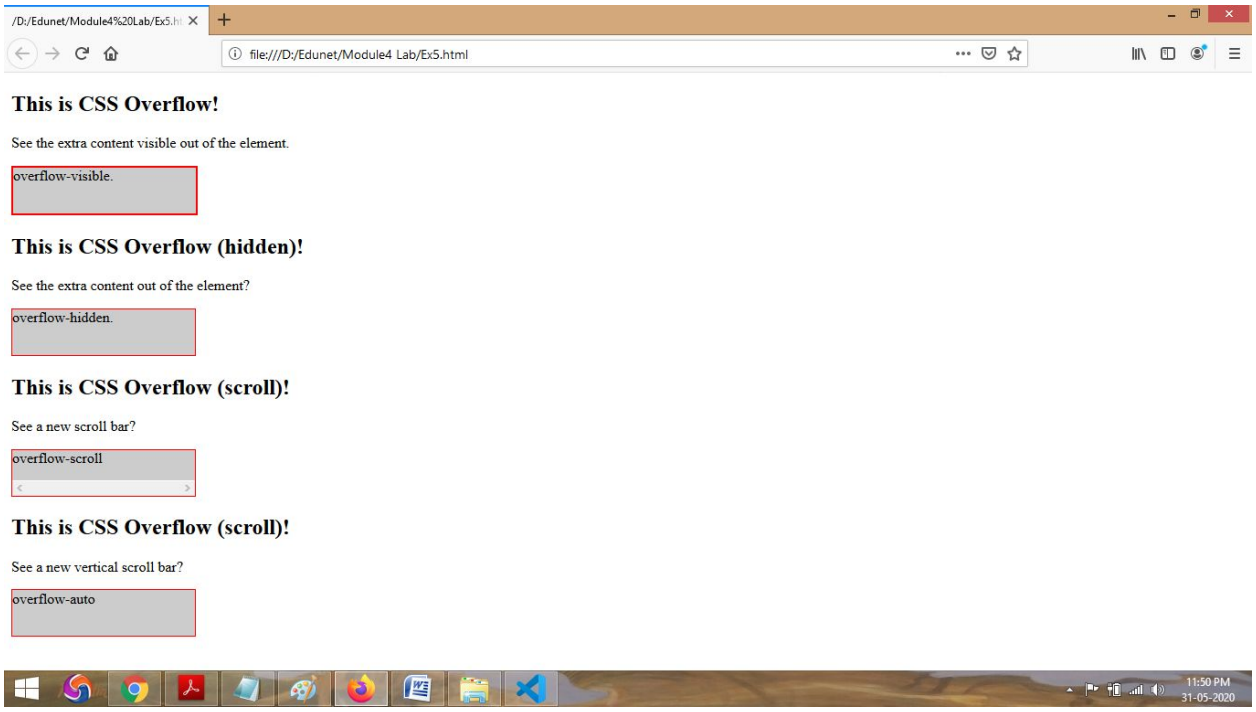

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 12

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Control the part of a CSS box to draw the background.

Duration: 2 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
    <style>
/* CSS Box to draw background */
        body {
            background-color: #F5F5F5;
            color: #555;
            font-size: 1.1em;
            font-family: 'Helvetica Neue', Helvetica, Arial, sans-seri
f;
        }
        .container {
            margin: 40px auto;
            width: 80%;
        }
        .el {
            padding: 40px;
            margin-bottom: 30px;
            background-color: #0099cc;
            color: white;
```

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```
            border: 30px solid rgba(224, 30, 108, 0.3);
            background-image: url(edu.jpg);
        }
        .el-2 {
            background-clip: padding-box;
        }
        .el p {
            padding: 20px;
            margin: 0;
            font-size: large;
            font-family: 'Lucida Sans', 'Lucida Sans Regular', 'Lucida
 Grande', 'Lucida Sans Unicode', Geneva, Verdana, sans-serif;
            color: red;
        }
    </style>
</head>
<body>
    <div class="container">
        <div class="el el-1">
            <p>
                My background painting area has the default <code>bord
er-box</code> value.
            </p>
        </div>
        <div class="el el-2">
            <p>
                My background painting area has the value <code>paddin
g-box</code>. No background is painted under the
                border.
            </p>
        </div>
    </div>
</body>
</html>
```

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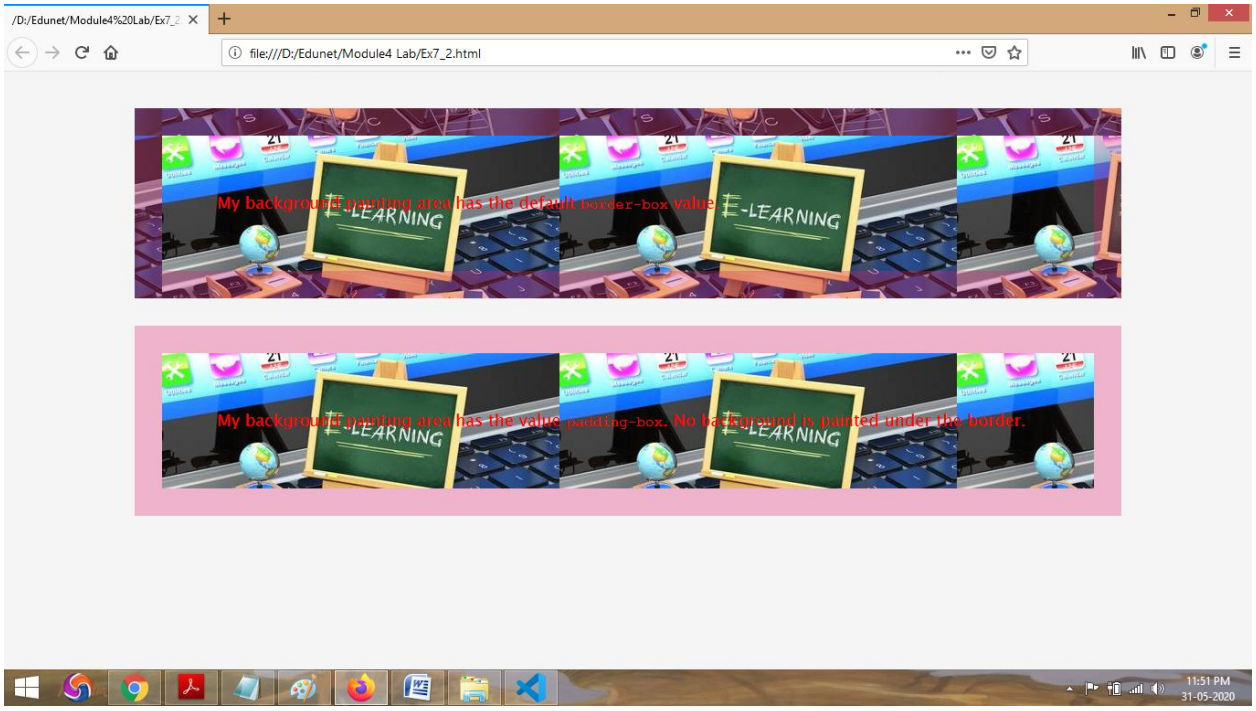
Output/Results snippet:


file:///D:/Edunet/Module4 Lab/Ex7_2.html
My background painting area has the default border-box value.
My background painting area has the value padding-box. No background is painted under the border.
11:51 PM
31-05-2020

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 13

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Create fancy boxes (also see the Styling boxes module, generally).

Duration: 2 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<head>
    <title>Fancy Boxes</title>
    <style>
        /*fancy-box */
        .fancy-box {
            background: #666;
            color: #fff;
            text-align: center;
            border: 5px solid #444;
            border-radius: 30px 30px 30px 30px;
            padding: 10px;
            margin: 1em 0;
        }
        .fancy-box .fancy-heading {
            font-family: Arial;
            font-size: 32px;
        }
        .fancy-box .fancy-button {
            background: #fff;
            color: #666;
```

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```
            padding: 1.5em;
        }
    </style>
</head>
<body>
    <div class="fancy-box">
        <p class="fancy-heading">This is where you put an amazing titl
e!</p>
    </div>
</body>
</html>
```

Output/Results snippet:

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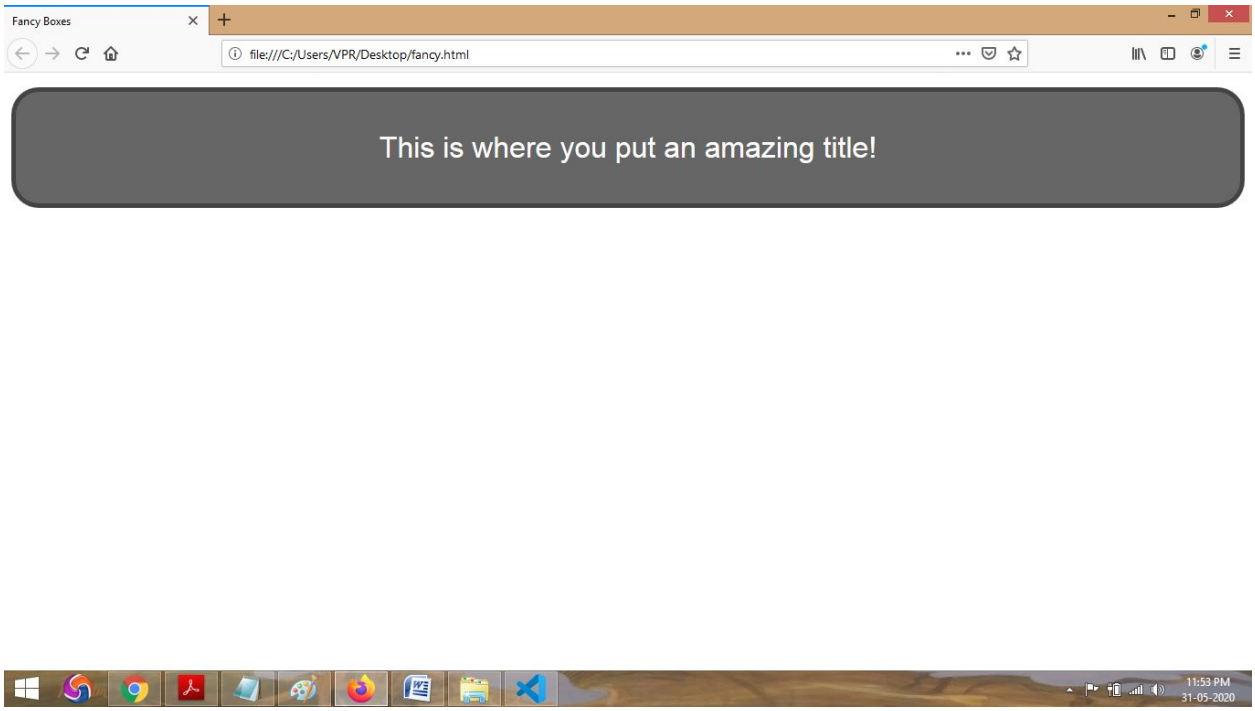

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 14

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Use background-clip to control background image.

Duration: 2 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
/* Background-Clip */
#example1 {
  border: 10px double green;
  padding: 15px;
  background: lightblue;
  background-clip: border-box;
}

#example2 {
  border: 10px dotted rebeccapurple;
  padding: 15px;
  background: lightblue;
  background-clip: padding-box;
}

#example3 {
  border: 10px dotted violet;
```

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```
  padding: 15px;
  background: lightblue;
  background-clip: content-box;
}
</style>
</head>
<body>

<h1>The background-clip Property</h1>

<p>The background-clip property defines how far the background should
extend within an element.</p>

<p>background-clip: border-box (this is default):</p>
<div id="example1">
  <p>The background extends behind the border.</p>
</div>

<p>background-clip: padding-box:</p>
<div id="example2">
  <p>The background extends to the inside edge of the border.</p>
</div>

<p>background-clip: content-box:</p>
<div id="example3">
  <p>The background extends to the edge of the content box.</p>
</div
<p><strong>Note:</strong> The background-clip property is not supporte
d in Internet Explorer 8 and earlier versions.</p>
</body>
</html>
```

Output/Results snippet:

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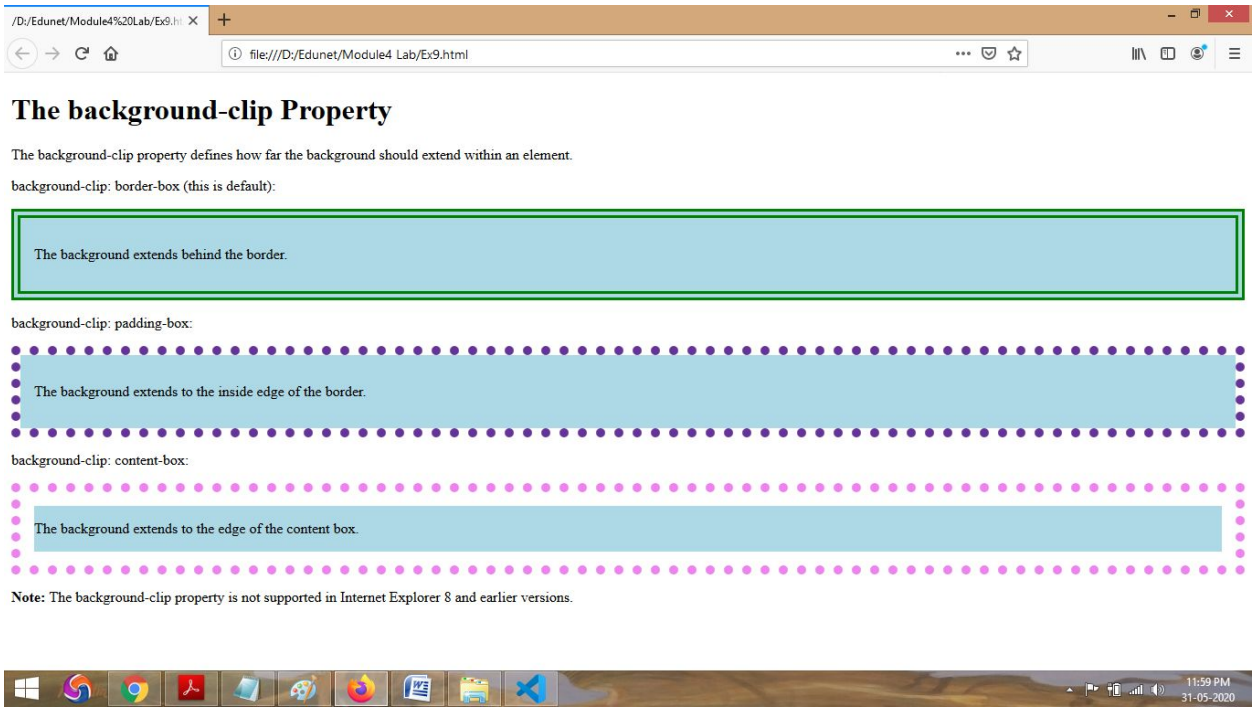
/D:/Edunet/Module4%20Lab/Ex9.ht
file:///D:/Edunet/Module4 Lab/Ex9.html
The background-clip Property
The background-clip property defines how far the background should extend within an element.
background-clip: border-box (this is default):
The background extends behind the border.
background-clip: padding-box:
The background extends to the inside edge of the border.
background-clip: content-box:
The background extends to the edge of the content box.
Note: The background-clip property is not supported in Internet Explorer 8 and earlier versions.
11:59 PM
31-05-2020

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 15

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Debug CSS in the browser.

Duration: 1 hour

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!doctype html public "-//w3c//dtd html 4.01//en">
<html>

<head>
    <title>box model</title>
    <style type="text/css">
        /* examples of margins, padding, and borders */
        ul {
            background: yellow;
            margin: 12px 12px 12px 12px;
            padding: 3px 3px 3px 3px;
            /* no borders set */
        }
        li {
            color: white;
            /* text color is white */
            background: blue;
            /* content, padding will be blue */
            margin: 12px 12px 12px 12px;
            padding: 12px 0px 12px 12px;
            /* note 0px padding right */
```

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```
            list-style: none
                /* no glyphs before a list item */
                /* no borders set */
        }
        li.withborder {
            border-style: dashed;
            border-width: medium;
            /* sets border width on all sides */
            border-color: lime;
        }
        body {
            margin: 2em
        }
        /* all margins set to 2em */
        body {
            margin: 1em 2em
        }
        /* top & bottom = 1em, right & left = 2em */
        body {
            margin: 1em 2em 3em
        }
    </style>
</head>
<body>
    <ul>
        <li>first element of list
        <li class="withborder">second element of list is
            a bit longer to illustrate wrapping.
    </ul>
</body>
</html>
```

Output/Results snippet:

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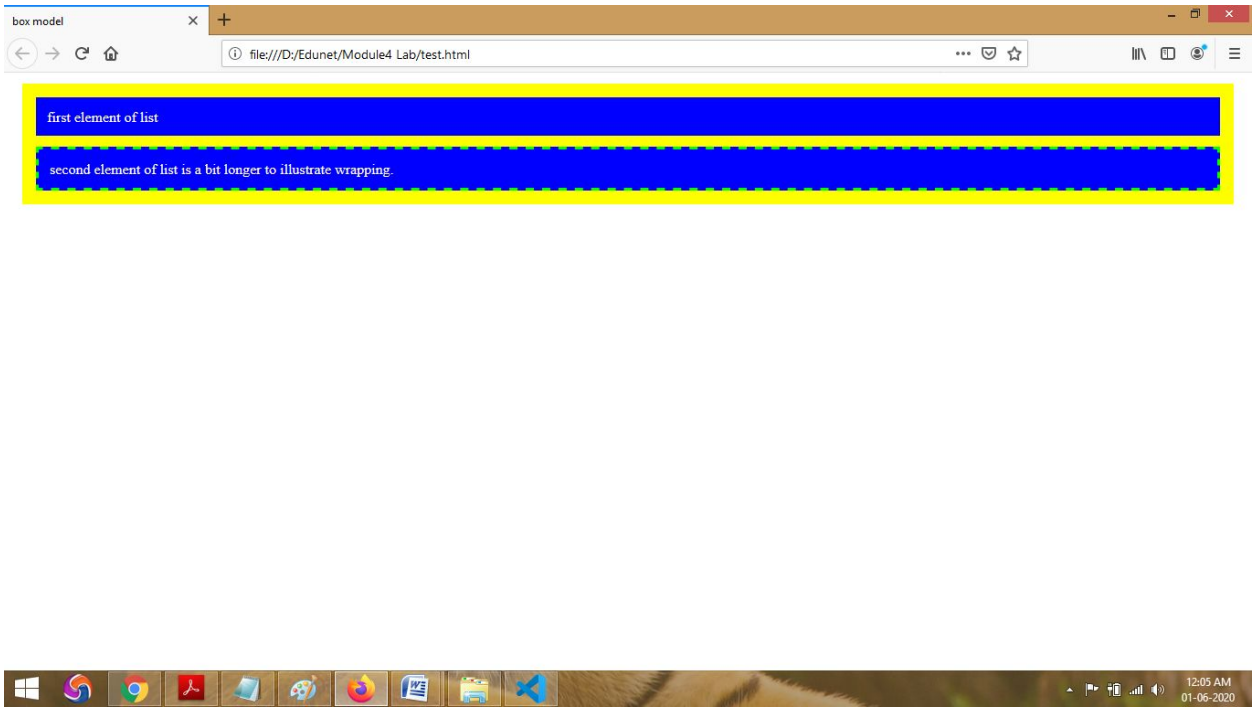

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 16

Aim: Scripting and styling the web (50 Hrs)

Learning outcome: Control backgrounds.

Duration: 3 hours

List of Hardware/Software requirements:

- Visual studio code
- Any One web browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>

<head>
    <style>
        /* Control Backgrounds*/
        body {
            background-image: url("edu.jpg");
            height: 100%;
            width: 100%;
            /* Center and scale the image nicely */
            background-position: center;
            background-repeat: no-repeat;
            background-size: cover;
        }

        h1,
        p {
            font-family: cursive;
            font-weight: bolder;
            color: white;
```

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```
        }

        div.first {
            background: rgba(128, 0, 0, 0.6);
        }
        div.second {
            background: rgba(128, 109, 0, 0.6);
            opacity: 0.6;
        }
    </style>
</head>
<body>
    <div class="first">
        <h1>Demo Background Property</h1>
    </div>
    <div class="second">
        <p>This text is not easy to read on this background image.</p>
    </div>
</body>
</html>
```

Output/Results snippet:

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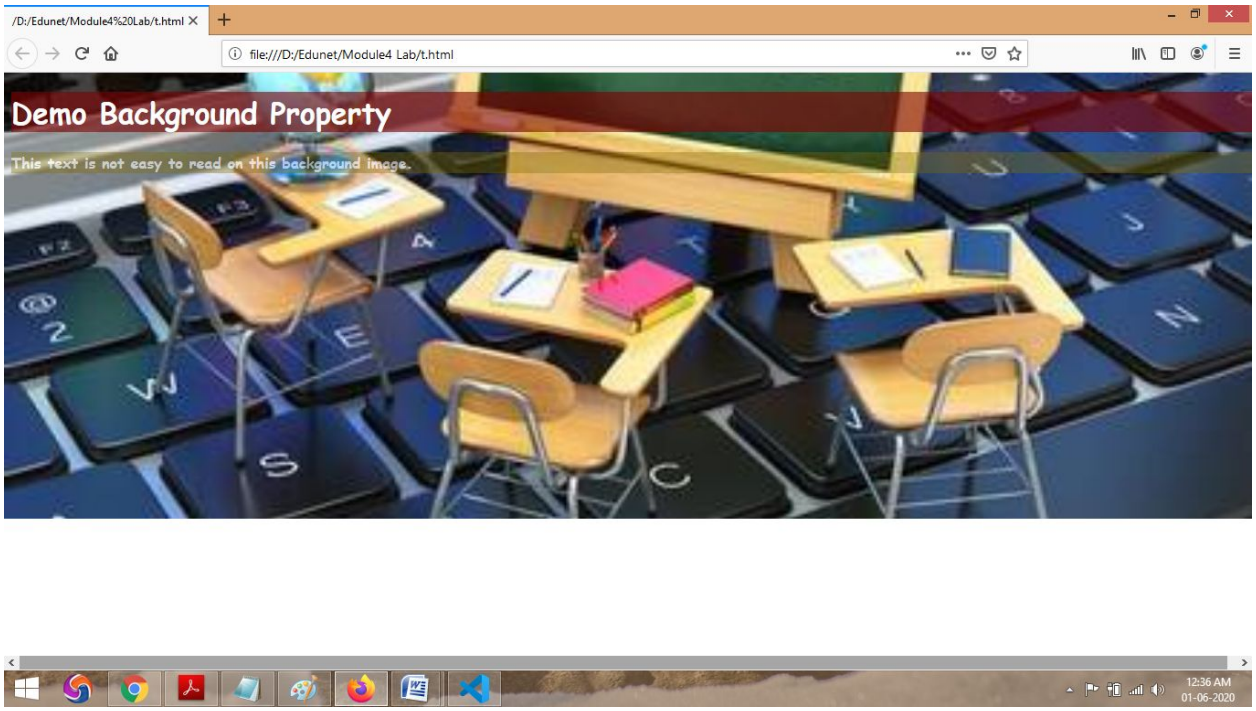
/D:/Edunet/Module4%20Lab/t.html
file:///D:/Edunet/Module4 Lab/t.html
Demo Background Property
This text is not easy to read on this background image.

References:

- https://developer.mozilla.org/en-US/docs/Web/CSS

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Activity 17

Aim: Apply control borders

Learning outcome: Able to understand how the web works.

Duration: 2 Hours

List of Hardware/Software requirements:

1. HTML Editor : Sublime Text Editor
2. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<html>
<head>
<style>
 /* Define look of the table */
table {
 border-width: 3px;
 background-color: #52E396;
}
tr, td {
 padding: 2px;
}
/* border-style example classes */
.b1 {border-style:none;}
.b2 {border-style:hidden;}
.b3 {border-style:dotted;}
.b4 {border-style:dashed;}
```

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```
.b5 {border-style:solid;}
.b6 {border-style:double;}
.b7 {border-style:groove;}
.b8 {border-style:ridge;}
.b9 {border-style:inset;}
.b10 {border-style:outset;}
</style>
</head>
<body>
 <table>
 <tr>
 <td class="b1">none</td>
 <td class="b2">hidden</td>
 <td class="b3">dotted</td>
 <td class="b4">dashed</td>
 </tr>
 <tr>
 <td class="b5">solid</td>
 <td class="b6">double</td>
<td class="b7">groove</td>
 <td class="b8">ridge</td>
 </tr>
 <tr>
 <td class="b9">inset</td>
 <td class="b10">outset</td>
 </tr>
```

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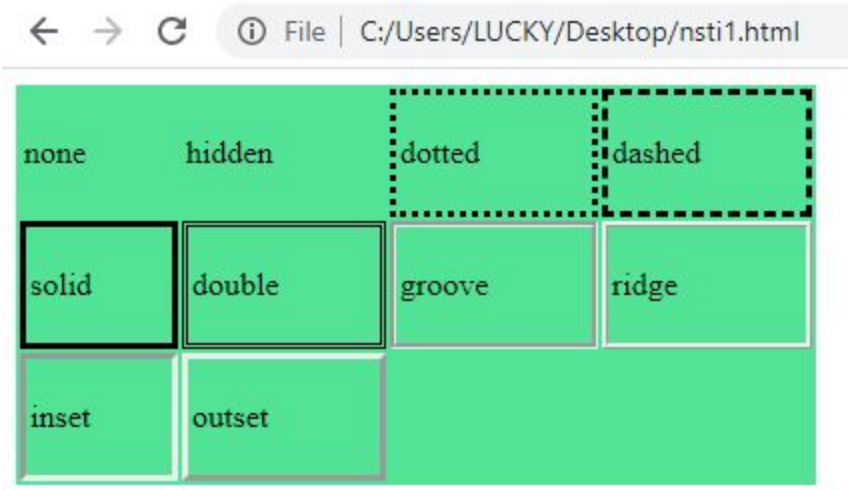
</table>

</body>

</html>

Output/Results snippet:



References:

- https://www.w3schools.com/css/css_border.asp
- https://www.html.am/html-codes/tables/table-border.cfm
- https://www.w3schools.com/css/css_border.asp

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Activity 18

Aim: Style an HTML table

Learning outcome: Able to understand how the web works.

Duration: 3 Hours

List of Hardware/Software requirements:

3. HTML Editor : Sublime Text Editor
4. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
#customers {
 font-family: "Trebuchet MS", Arial, Helvetica, sans-serif;
border-collapse: collapse;
 width: 100%;
}
#customers td, #customers th {
 border: 1px solid #ddd;
 padding: 8px;
}
```

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```
#customers tr:nth-child(even){background-color: #f2f2f2;}
#customers tr:hover {background-color: #ddd;}
#customers th {
 padding-top: 12px;
 padding-bottom: 12px;
 text-align: left;
 background-color: #4CAF50;
 color: white;
}
</style>
</head>
<body>
<table id="customers">
 <tr>
 <th>Company</th>
<th>Contact</th>
 <th>Country</th>
 </tr>
 <tr>
 <td>Alfreds Futterkiste</td>
 <td>Maria Anders</td>
 <td>Germany</td>
```

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```
</tr>
<tr>
<td>Berglunds snabbköp</td>
<td>Christina Berglund</td>
<td>Sweden</td>
</tr>
<tr>
<td>Centro comercial Moctezuma</td>
<td>Francisco Chang</td>
<td>Mexico</td>
</tr>
<tr>
<td>Ernst Handel</td>
<td>Roland Mendel</td>
<td>Austria</td>
</tr>
<tr>
<td>Island Trading</td>
<td>Helen Bennett</td>
<td>UK</td>
</tr>
<tr>
```

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<td>Königlich Essen</td>

<td>Philip Cramer</td>

<td>Germany</td>

</tr>

<tr>

<td>Laughing Bacchus Winecellars</td>

<td>Yoshi Tannamuri</td>

<td>Canada</td>

</tr>

<tr>

<td>Magazzini Alimentari Riuniti</td>

<td>Giovanni Rovelli</td>

<td>Italy</td>

</tr>

<tr>

<td>North/South</td>

<td>Simon Crowther</td>

<td>UK</td>

</tr>

<tr>

<td>Paris spécialités</td>

<td>Marie Bertrand</td>

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```
<td>France</td>
</tr>
</table>
</body>
</html>
```

Output/Results snippet:

Company	Contact	Country
Alfreds Futterkiste	Maria Anders	Germany
Berglunds snabbköp	Christina Berglund	Sweden
Centro comercial Moctezuma	Francisco Chang	Mexico
Ernst Handel	Roland Mendel	Austria
Island Trading	Helen Bennett	UK
Königlich Essen	Philip Cramer	Germany
Laughing Bacchus Winecellars	Yoshi Tannamuri	Canada
Magazzini Alimentari Riuniti	Giovanni Rovelli	Italy
North/South	Simon Crowther	UK
Paris spécialités	Marie Bertrand	France

References:

- https://www.w3schools.com/css/css_table.asp

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Activity 19

Aim: Add shadows to boxes

Learning outcome: Able to understand how the web works.

Duration: 2 Hours

List of Hardware/Software requirements:

1. HTML Editor : Sublime Text Editor
2. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
#example1 {
 border: 1px solid;
 padding: 10px;
 box-shadow: 5px 5px blue, 10px 10px red, 15px 15px green;
}
#example2 {
 border: 1px solid;
```

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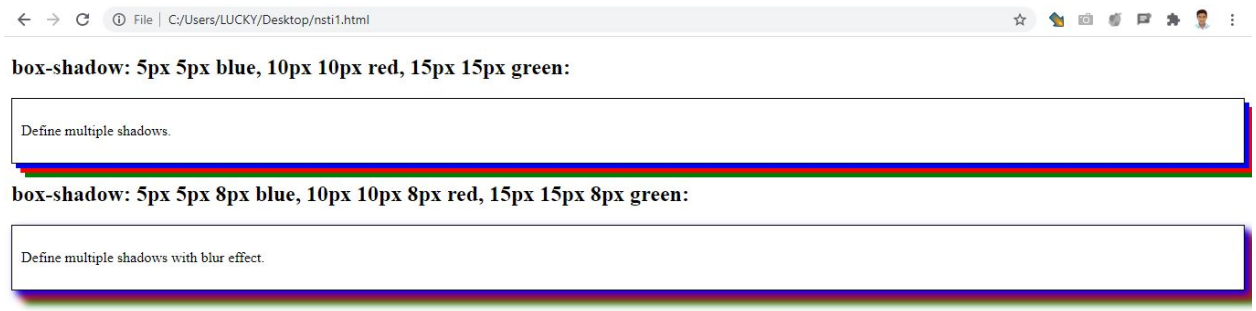
```
padding: 10px;
box-shadow: 5px 5px 8px blue, 10px 10px 8px red, 15px 15px 8px green;
}
</style>
</head>
<body>
<h2>box-shadow: 5px 5px blue, 10px 10px red, 15px 15px green:</h2>
<div id="example1">
<p>Define multiple shadows.</p>
</div>
<h2>box-shadow: 5px 5px 8px blue, 10px 10px 8px red, 15px 15px 8px green:</h2>
<div id="example2">
<p>Define multiple shadows with blur effect.</p>
</div>
</body>
</html>
```

Output/Results snippet:


File | C:/Users/LUCKY/Desktop/nsti1.html
box-shadow: 5px 5px blue, 10px 10px red, 15px 15px green:
Define multiple shadows.
box-shadow: 5px 5px 8px blue, 10px 10px 8px red, 15px 15px 8px green:
Define multiple shadows with blur effect.

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References:

- https://www.w3schools.com/cssref/css3_pr_box-shadow.asp
- https://www.w3schools.com/css/css3_shadows.asp

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Activity 20

Aim: Calculate specificity of a CSS selector

Learning outcome: Able to understand how the web works.

Duration: 3 Hours

List of Hardware/Software requirements:

3. HTML Editor : Sublime Text Editor
4. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
/*Element Selector*/
h1
{background-color: yellow;
text-align: center;}
/*Class Selector*/
.center {
  background-color: red;
  text-align: center;
  color: green;
```

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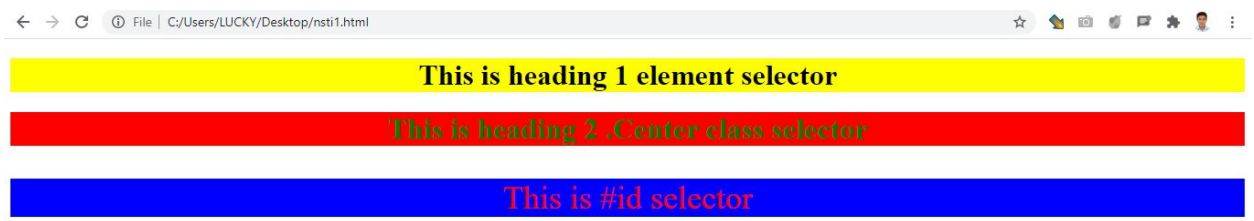
```
}
/*id selector*/
#header{
  background-color: blue;
  text-align: center;
  color: red;
  font-size:36px;
}
</style>
</head>
<body>
<h1>This is heading 1 element selector</h1>
<h1 class="center">This is heading 2 .Center class selector</h1>
<p id="header">This is #id selector</p>
</body>
</html>
```

Output/Results snippet:


File | C:/Users/LUCKY/Desktop/nsti1.html
This is heading 1 element selector
This is heading 2 .Center class selector
This is #id selector

References:

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- https://www.w3schools.com/css/css_selectors.asp

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Activity 21

Aim: Control Inheritance in CSS

Learning outcome: Able to understand how the web works.

Duration: 2 Hours

List of Hardware/Software requirements:

1. HTML Editor : Sublime Text Editor
2. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
span {
 color: blue;
 border: 1px solid black;
}
.extra span {
 color: inherit;
}
</style>
</head>
```

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```
<body>
<div>
Here is <span>a span element</span> which is blue, as span elements are set to be.
</div>
<div class="extra" style="color:green">
Here is <span>a span element</span> which is green, because it inherits from its parent.
</div>
<div style="color:red">
Here is <span>a span element</span> which is blue, as span elements are set to be.
</div>
</body>
</html>
```

Output/Results snippet:

File | C:/Users/LUCKY/Desktop/nsti1.html
Here is a span element which is blue, as span elements are set to be.
Here is a span element which is green, because it inherits from its parent.
Here is a span element which is blue, as span elements are set to be.

References:

- https://stackoverflow.com/questions/641217/css-control-inheritance-inheriting-other-control-styles

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Activity 22

Aim: Apply filters in CSS

Learning outcome: Able to understand how the web works.

Duration: 2 Hours

List of Hardware/Software requirements:

1. HTML Editor : Sublime Text Editor
2. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
img {
 -webkit-filter: grayscale(100%); /* Safari 6.0 - 9.0 */
 filter: grayscale(100%);
}
</style>
</head>
<body>
<h1>The filter Property</h1>
<p>Convert the image to grayscale:</p>
```

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```
<img src="download.png" alt="CSS" width="300" height="300">
<p><strong>Note:</strong> The filter property is not supported in Internet Explorer, Edge
12, or Safari 5.1 and earlier.</p>
</body>
</html>
```

Output/Results snippet:

File | C:/Users/LUCKY/Desktop/nsti1.html
The filter Property
Convert the image to grayscale:
GET STYLING WITH
CSS
Note: The filter property is not supported in Internet Explorer, Edge 12, or Safari 5.1 and earlier.

References:

- https://www.w3schools.com/cssref/css3_pr_filter.asp

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Activity 23

Aim: Apply blend modes in CSS

Learning outcome: Able to understand how the web works.

Duration: 2 Hours

List of Hardware/Software requirements:

1. HTML Editor : Sublime Text Editor
2. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
#myDIV {
 width: 400px;
 height: 400px;
 background-repeat: no-repeat, repeat;
 background-image: url("img_5terre.jpg"),url("download.png");
 background-blend-mode: lighten;
}
</style>
</head>
```

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```
<body>
<h1>The background-blend-mode Property</h1>
<div id="myDIV"></div>
<p><b>Note:</b> Edge/Internet Explorer do not support the background-blend-mode
property.</p>
</body>
</html>
```

Output/Results snippet:

References:

- https://www.w3schools.com/cssref/pr_background-blend-mode.asp

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Activity 24

Aim: Apply CSS multi-column layouts

Learning outcome: Able to understand how the web works.

Duration: 3 Hours

List of Hardware/Software requirements:

1. HTML Editor : Sublime Text Editor
2. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
.newspaper {
 -webkit-column-count: 3; /* Chrome, Safari, Opera */
 -moz-column-count: 3; /* Firefox */
 column-count: 3;
 -webkit-column-gap: 40px; /* Chrome, Safari, Opera */
 -moz-column-gap: 40px; /* Firefox */
 column-gap: 40px;
```

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```
-webkit-column-rule-style: solid; /* Chrome, Safari, Opera */
 -moz-column-rule-style: solid; /* Firefox */
 column-rule-style: solid;
}
</style>
</head>

<body>
<p><b>Note:</b> Internet Explorer 9, and earlier versions, does not support the columnrule-style property.</p>
<div class="newspaper">
HyperText Markup Language (HTML) is a markup language[1] for creating a webpage. Webpages are usually viewed in a web browser. They can include writing, links, pictures, and even sound and video. HTML is used to mark and describe each of these kinds of content so the web browser can display them correctly. HTML can also be used to add meta information to a webpage. Meta information is usually not shown by web browsers and is data about the web page, e.g., the name of the person who created the page. Cascading Style Sheets (CSS) is used to style HTML elements while JavaScript is used to manipulate HTML elements and CSS styles.
</div>
</body>
</html>
```

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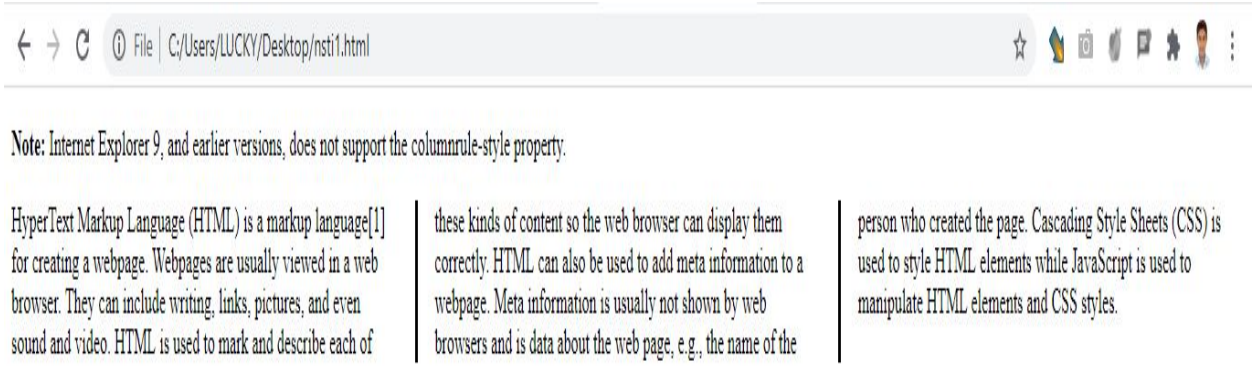
Output/Results snippet:


File | C:/Users/LUCKY/Desktop/nsti1.html
Note: Internet Explorer 9, and earlier versions, does not support the columnrule-style property.
HyperText Markup Language (HTML) is a markup language[1] for creating a webpage. Webpages are usually viewed in a web browser. They can include writing, links, pictures, and even sound and video. HTML is used to mark and describe each of
these kinds of content so the web browser can display them correctly. HTML can also be used to add meta information to a webpage. Meta information is usually not shown by web browsers and is data about the web page, e.g., the name of the
person who created the page. Cascading Style Sheets (CSS) is used to style HTML elements while JavaScript is used to manipulate HTML elements and CSS styles.

References:

- https://www.w3schools.com/css/css3_multiple_columns.asp

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Activity 25

Aim: Apply CSS generated Content

Learning outcome: Able to understand how the web works.

Duration: 2 Hours

List of Hardware/Software requirements:

1. HTML Editor : Sublime Text Editor
2. Web Browser : Google Chrome/Mozilla Firefox

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
ul {
 list-style: none; /* Remove HTML bullets */
 padding: 0;
 margin: 0; }
li {
 padding-left: 16px; }
li::before {
 content: "•"; /* Insert content that looks like bullets */
```

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```
padding-right: 8px;
color: blue; /* Or a color you prefer */ }
</style>
</head>
<body>
<h1>The content Property</h1>
<ul>
 <li>Coffee</li>
 <li>Tea</li>
 <li>Coca Cola</li>
</ul>
</body>
</html>
```

Output/Results snippet:

References:

- https://www.w3schools.com/cssref/pr_gen_content.asp

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Learning Outcome 4 - Able to understand enhancing the web using PHP

After achieving this learning outcome, a student will be able to understand enhancing the web using PHP. In order to achieve this learning outcome, a student has to complete the following:

1. Create a form in PHP and apply validations. (5Hrs)
2. Create a date and time from a number of parameters in mktime() (2 Hrs)
3. Create a date and time from the strtotime () function (2Hrs)
4. Create more dates/times from strtotime () (1Hr)
5. Output the dates for the next six Saturdays (3Hrs)
6. Output the number of days until 10th of july (2 Hrs)
7. Create and retrieve a cookie (5Hrs)
8. Modify a cookie value (2 Hrs)
9. Delete a cookie (1Hrs)
10. Check if cookies are enabled (2Hrs)
11. Select data with MySQLi (Object-oriented) (5Hrs)
12. Select data with MySQLi (Object-oriented) and put result in an HTML table (10 Hrs)
13. Select data with MySQLi (Procedural) (5Hrs)
14. Select data with PDO (+ Prepared statements)(5Hrs)

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Activity 1

Aim: Create a form in PHP and apply validations. (5 Hrs)

Learning outcome: Enhancing the web using PHP.

Duration: 5 hours

List of Hardware/Software requirements:

1. Laptop/Computer with Linux OS - Ubuntu 18.04 LTS
2. Notepad++, XAMPP

Code/Program:

```
<!DOCTYPE HTML>
<html>
<head>
</head>
<body>
<?php
// define variables and set to empty values
$name = $email = $gender = $comment = $website = "";
if ($_SERVER["REQUEST_METHOD"] == "POST") {
$name = test_input($_POST["name"]);
$email = test_input($_POST["email"]);
$website = test_input($_POST["website"]);
```

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```
$comment = test_input($_POST["comment"]);
$gender = test_input($_POST["gender"]);
}
function test_input($data) {    //Function name is test_input
$data = trim($data);
$data = stripslashes($data);
$data = htmlspecialchars($data);
return $data;
}
?>
<h2>PHP Form Validation Example</h2>
<form method="post" action="<?php echo htmlspecialchars($_SERVER["PHP_SELF"]);?>">
Name: <input type="text" name="name">
<br><br>
E-mail: <input type="text" name="email">
<br><br>
Website: <input type="text" name="website">
<br><br>
Comment: <textarea name="comment" rows="5" cols="40"></textarea>
<br><br>
Gender:
<input type="radio" name="gender" value="female">Female
```

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```
<input type="radio" name="gender" value="male">Male
<input type="radio" name="gender" value="other">Other
<br><br>
<input type="submit" name="submit" value="Submit">
</form>
<?php
echo "<h2>Your Input:</h2>";
echo $name;
echo "<br>";
echo $email;
echo "<br>";
echo $website;
echo "<br>";
echo $comment;
echo "<br>";
echo $gender;
?>
</body>
</html>
```

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Output/Results snippet:

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Activity 2

Aim: Create a date and time from a number of parameters in mktime() (2 Hrs)

Learning outcome: Enhancing the web using PHP..

Duration: 2 hours

List of Hardware/Software requirements:

1. Laptop/Computer with Linux OS - Ubuntu 18.04 LTS
2. Notepad++, XAMPP

Code/Program:

```
<?php
// Set the default timezone to use. Available as of PHP 5.1
date_default_timezone_set('UTC');
// Prints: July 1, 2000 is on a Saturday
echo "July 1, 2000 is on a " . date("l", mktime(0, 0, 0, 7, 1, 2000));
// Prints something like: 2006-04-05T01:02:03+00:00
echo date('c', mktime(1, 2, 3, 4, 5, 2006));
?>
```

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Output/Results snippet:

```
July 1, 2000 is on a Saturday2006-04-05T01:02:03+00:00
```

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Activity 3

Aim: Create a date and time from the strtotime () function (2 Hrs)

Learning outcome: Enhancing the web using PHP..

Duration: 2 hours

List of Hardware/Software requirements:

1. Laptop/Computer with Linux OS - Ubuntu 18.04 LTS
2. Notepad++, XAMPP

Code/Program:

```
<!DOCTYPE html>

<html>

<body>

<?php

echo date("r", strtotime("now"));

?>

</body>

</html>
```

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Output/Results snippet:

```
Mon, 20 Jul 2020 14:49:28 +0200
```

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Activity 4

Aim: Create more dates/times from strtotime () (1 Hr)

Learning outcome: Enhancing the web using PHP..

Duration: 1 hour

List of Hardware/Software requirements:

1. Laptop/Computer with Linux OS - Ubuntu 18.04 LTS
2. Notepad++, XAMPP

Code/Program:

```
<!DOCTYPE html>
<html>
<body>
<?php
echo(strtotime("now") . "<br>");
echo(strtotime("3 October 2005") . "<br>");
echo(strtotime("+5 hours") . "<br>");
echo(strtotime("+1 week") . "<br>");
echo(strtotime("+1 week 3 days 7 hours 5 seconds") . "<br>");
echo(strtotime("next Monday") . "<br>");
echo(strtotime("last Sunday"));
?>
</body>
```

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</html>

Output/Results snippet:

```
1595249681
1128290400
1595267681
1595854481
1596138886
1595800800
1595109600
```

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Activity 5

Aim: Output the dates for the next six Saturdays (3 Hrs)

Learning outcome: Enhancing the web using PHP..

Duration: 3 hours

List of Hardware/Software requirements:

1. Laptop/Computer with Linux OS - Ubuntu 18.04 LTS
2. Notepad++, XAMPP

Code/Program:

```
<!DOCTYPE html>
<html>
<body>
<?php
$startdate=strtotime("Saturday");
$enddate=strtotime("+6 weeks", $startdate);
while ($startdate < $enddate) {
echo date("M d", $startdate) . "<br>";
$startdate = strtotime("+1 week", $startdate);
}
?>
</body>
</html>
```

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Output/Results snippet:

Jul 25
Aug 01
Aug 08
Aug 15
Aug 22
Aug 29

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Activity 6

Aim: Output the number of days until 10th of July (2 Hrs)

Learning outcome: Enhancing the web using PHP..

Duration: 2 hours

List of Hardware/Software requirements:

1. Laptop/Computer with Linux OS - Ubuntu 18.04 LTS
2. Notepad++, XAMPP

Code/Program:

```
<!DOCTYPE html>

<html>

<body>

<?php

$d1=strtotime("July 10");

$d2=ceil(($d1-time())/60/60/24);

echo "There are " . $d2 ." days until 10th of July.";

?>

</body>

</html>
```

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Output/Results snippet:

```
There are -10 days until 10th of July.
```

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Activity 7

Aim: Create and retrieve a cookie (5 Hrs)

Learning outcome: Enhancing the web using PHP..

Duration: 5 hours

List of Hardware/Software requirements:

3. Laptop/Computer with Linux OS - Ubuntu 18.04 LTS
4. Notepad++, XAMPP

Code/Program:

```
<!DOCTYPE html>
<?php
$cookie_name = "user"; // Setting cookie name
$cookie_value = "John Doe"; // Setting cookie value
setcookie($cookie_name, $cookie_value, time() + (86400 * 30), "/");  // 86400 = 1 day
?>
<html>
<body>
<?php
if(!isset($_COOKIE[$cookie_name])) {
echo "Cookie named '" . $cookie_name . "' is not set!";
} else {
echo "Cookie '" . $cookie_name . "' is set!<br>";
```

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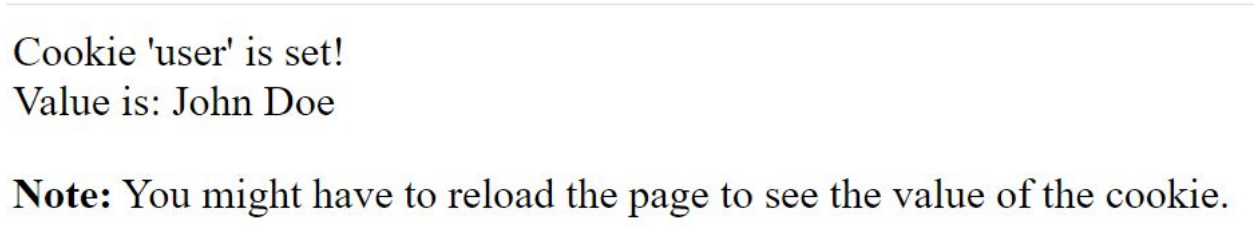
```
echo "Value is: " . $_COOKIE[$cookie_name];

}

?>

<p><strong>Note:</strong> You might have to reload the page to see the value of the
cookie.</p>

</body>

</html>
```

Output/Results snippet:



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References:

https://www.tutorialspoint.com/php/index.htm

https://www.w3schools.com/php/default.asp

https://www.geeksforgeeks.org/php/

https://www.javatpoint.com/php-tutorial

https://www.educba.com/introduction-to-php/

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Activity 8

Aim: Modify a cookie value (2 Hrs)

Learning outcome: Enhancing the web using PHP.

Duration: 2 hour

List of Hardware/Software requirements:

1. Laptop / Desktop
2. Windows 7
3. WAMP Software

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<?php
$cookie_name = "user";
$cookie_value = "Alex Porter"; // New cookie value added
setcookie($cookie_name, $cookie_value, time() + (86400 * 30), "/");
?>
<html>
<body>
<?php
if(!isset($_COOKIE[$cookie_name])) {
 echo "Cookie named '" . $cookie_name . "' is not set!";
```

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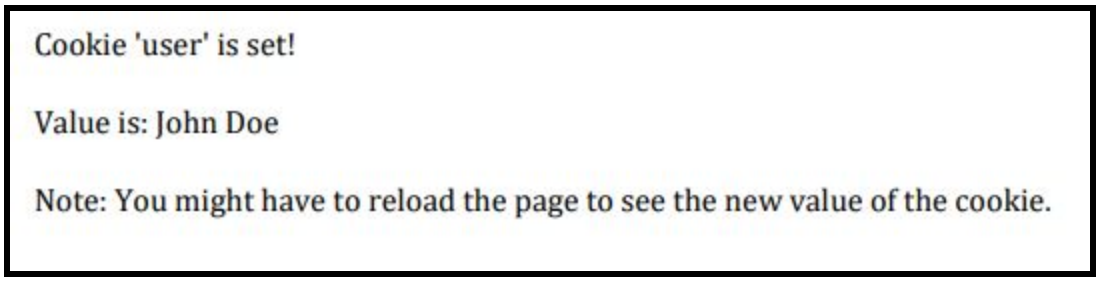
```
} else {
 echo "Cookie '" . $cookie_name . "' is set!<br>";
 echo "Value is: " . $_COOKIE[$cookie_name];
}
?>
<p><strong>Note:</strong> You might have to reload the page to see the new value of the
cookie.</p>
</body>
</html>
```

Output/Results snippet:

Modify Cookie Value



References:

- NSTI Practical Lab Manual

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Activity 9

Aim: Delete a cookie (1 Hr)

Learning outcome: Enhancing the web using PHP.

Duration: 1 hour

List of Hardware/Software requirements:

1. Laptop / Desktop
2. Windows 7
3. WAMP Software

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<?php
// set the expiration date to one hour ago
setcookie("user", "", time() - 3600);
?>
<html>
<body>
<?php
echo "Cookie 'user' is deleted.";
?>
</body>
</html>
```

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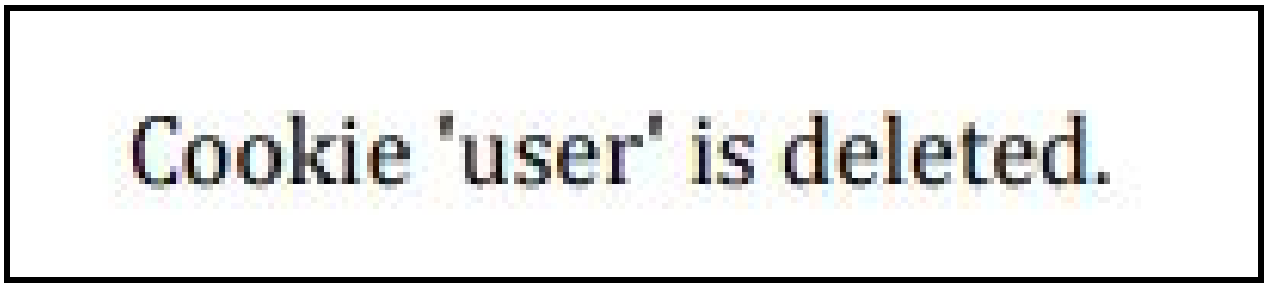
Output/Results snippet:

Delete a Cookie



References:

- NSTI Practical Lab Manual

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Activity 10

Aim: Check if cookies are enabled (2Hrs)

Learning outcome: Enhancing the web using PHP.

Duration: 2 hours

List of Hardware/Software requirements:

1. Laptop / Desktop
2. Windows 7
3. WAMP Software

Code/Program/Procedure (with comments):

```
<html>
<?php
setcookie("test_cookie", "test", time() + 3600, '/');
?>
<html>
<body>
<?php
if(count($_COOKIE) > 0) { // check the availability of Cookie
 echo "Cookies are enabled.";
} else {
 echo "Cookies are disabled.";
}
```

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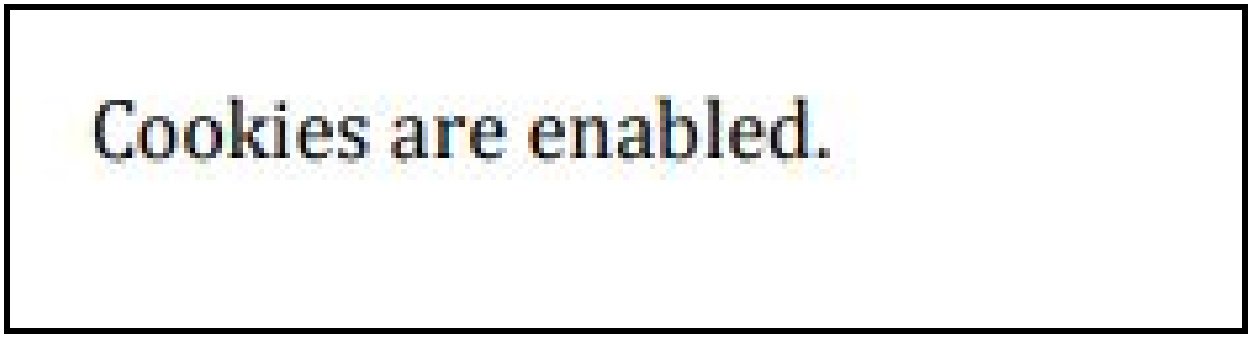
?>

</body>

</html>

Output/Results snippet:

Check the Cookie is enable or not



References:

- NSTI Practical Lab Manual

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Activity 11

Aim: Select data with MySQLi (Object-oriented) (5Hrs)

Learning outcome: Enhancing the web using PHP.

Duration: 5 hours

List of Hardware/Software requirements:

1. Laptop / Desktop
2. Windows 7
3. WAMP Software

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>

<html>

<body>

<?php

$servername = "localhost";

$username = "username";

$password = "password";

$dbname = "myDB";

// Create connection

$conn = new mysqli($servername, $username, $password, $dbname);

// Check connection

if ($conn->connect_error) {
```

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```
 die("Connection failed: " . $conn->connect_error);
}
$sql = "SELECT id, firstname, lastname FROM MyGuests";
$result = $conn->query($sql);
if ($result->num_rows > 0) {
 // output data of each row
 while($row = $result->fetch_assoc()) {
 echo "<br> id: ". $row["id"]. " - Name: ". $row["firstname"]. " " . $row["lastname"] .
"<br>";
 }
} else {
 echo "0 results";
}
$conn->close();
?>
</body>
</html>
```

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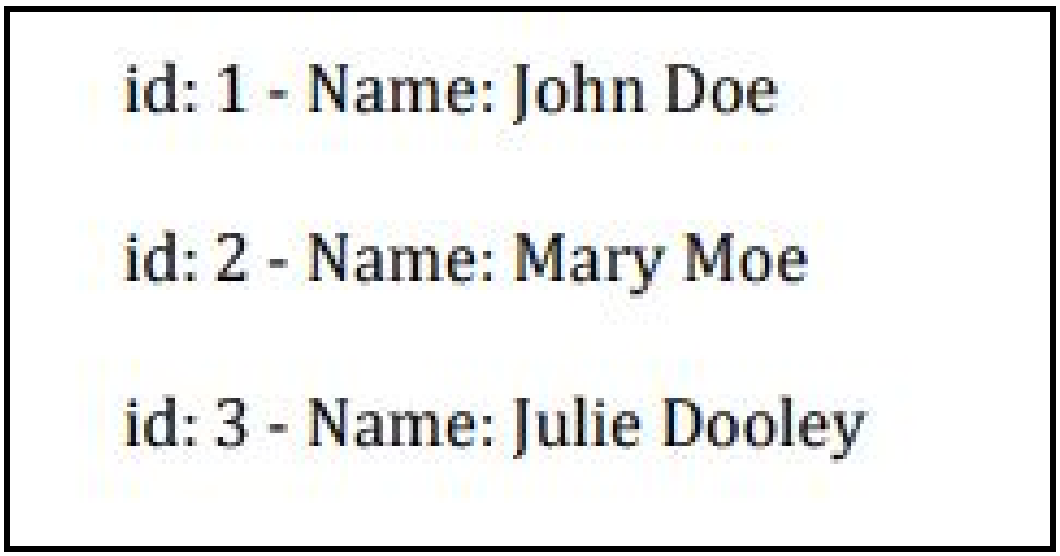
Output/Results snippet:

Displaying records



References:

- NSTI Practical Lab Manual

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Activity 12

Aim: Select data with MySQLi (Object-oriented) and put result in an HTML table (10 Hrs)

Learning outcome: Enhancing the web using PHP.

Duration: 5 hours

List of Hardware/Software requirements:

4. Laptop / Desktop
5. Windows 7
6. WAMP Software

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<head>
<style>
table, th, td {
 border: 1px solid black;
}
</style>
</head>
<body>
<?php
$servername = "localhost";
```

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```
$username = "username";
$password = "password";
$dbname = "myDB";
// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
 die("Connection failed: " . $conn->connect_error);
}
$sql = "SELECT id, firstname, lastname FROM MyGuests";
$result = $conn->query($sql);
if ($result->num_rows > 0) {
 echo "<table><tr><th>ID</th><th>Name</th></tr>";
 // output data of each row
 while($row = $result->fetch_assoc()) {
 echo "<tr><td>" . $row["id"]. "</td><td>" . $row["firstname"]. " " . $row["lastname"].
"</td></tr>";
 }
 echo "</table>";
} else {
 echo "0 results";
}
```

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```
$conn->close();

?>

</body>

</html>
```

Output/Results snippet:

Displaying records in Table

ID	Name
1	John Doe
2	Mary Moe
3	Julie Dooley

References:

- NSTI Practical Lab Manual

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Activity 13

Aim: Select data with MySQLi (Procedural)

Learning outcome: Able to understand how the web works.

Duration: 5 hours

List of Hardware/Software requirements:

1. Windows/Ubuntu OS
2. LAMP/XAMPP Setup
3. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<?php
$servername = "localhost";
$username = "root";
$password = "";
$dbname = "myDB";
// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
```

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```
if (!$conn) {
die("Connection failed: " . mysqli_connect_error());
}
$sql = "SELECT id, firstname, lastname FROM MyGuests";
$result = mysqli_query($conn, $sql);
if (mysqli_num_rows($result) > 0) {
// output data of each row
while($row = mysqli_fetch_assoc($result)) {
echo "id: " . $row["id"]. " - Name: " . $row["firstname"]. " " . $row["lastname"]. "<br>";
}
} else {
echo "0 results";
}
mysqli_close($conn);
?>
</body>
</html>
```

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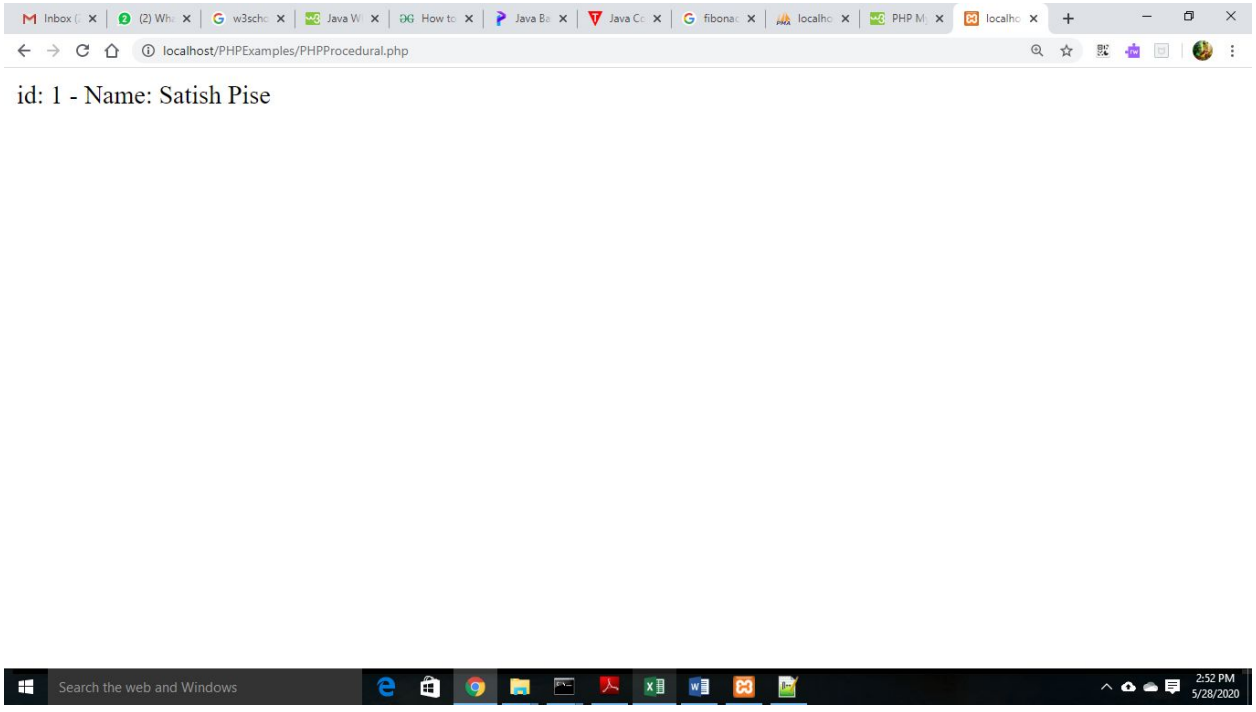
Output/Results snippet:



References:

- https://www.w3schools.com/php/php_mysql_connect.asp
- https://www.javatpoint.com/php-tutorial

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Activity 14

Aim: Select data with PDO (+ Prepared statements)

Learning outcome: Able to understand how the web works.

Duration: 5 hours

List of Hardware/Software requirements:

4. Windows/Ubuntu OS
5. LAMP/XAMPP Setup
6. Browser

Code/Program/Procedure (with comments):

```
<!DOCTYPE html>
<html>
<body>
<?php
echo "<table style='border: solid 1px black;'>";
echo "<tr><th>Id</th><th>Firstname</th><th>Lastname</th></tr>";
class TableRows extends RecursiveIteratorIterator {
function __construct($it) {
parent::__construct($it, self::LEAVES_ONLY);
}
function current() {
```

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```
return "<td style='width: 150px; border: 1px solid black;'>" . parent::current(). "</td>";
}
function beginChildren() {
echo "<tr>";
}
function endChildren() {
echo "</tr>" . "\n";
}
}
$servername = "localhost";
$username = "root";
$password = "";
$dbname = "myDB";
try {
$conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
$conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
$stmt = $conn->prepare("SELECT id, firstname, lastname FROM MyGuests");
$stmt->execute();
// set the resulting array to associative
$result = $stmt->setFetchMode(PDO::FETCH_ASSOC);
foreach(new TableRows(new RecursiveArrayIterator($stmt->fetchAll())) as $k=>$v) {
echo $v;
```

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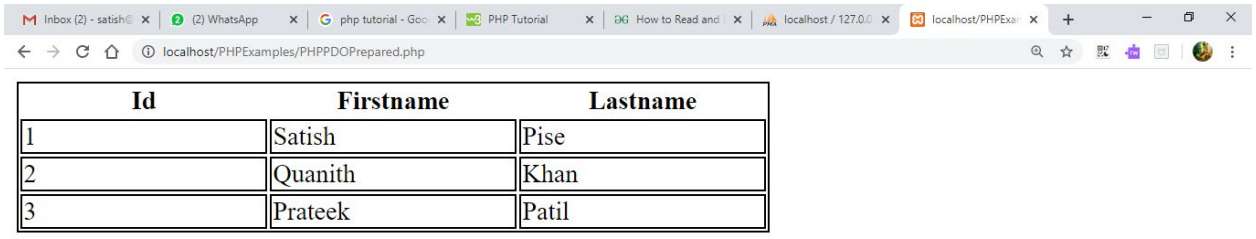
```
}
}
catch(PDOException $e) {
echo "Error: " . $e->getMessage();
}
$conn = null;
echo "</table>";
?>
</body>
</html>
```

Output/Results snippet:



Id	Firstname	Lastname
1	Satish	Pise
2	Quanith	Khan
3	Prateek	Patil

References:

- https://www.w3schools.com/php/php_mysql_connect.asp
- https://www.javatpoint.com/php-tutorial

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Learning Outcome 5 - Able to understand Java: The key language

After achieving this learning outcome, a student will be able to understand Java: The key language. In order to achieve this learning outcome, a student has to complete the following:

1. Write a Java Programme to print Hello on Screen (2 Hrs)
2. Write a Java Program to find arithmetic Operations (1 Hr)
3. Write a Java Program to find the biggest no. in given three nos. (2Hrs)
4. Write a java program to print Fibonacci series without using recursion and using recursion (2Hrs)
5. Java Program to Solve any Linear Equation in One Variable (3Hrs)
6. Java Program to Find Inverse of a Matrix (3Hrs)
7. Java Program to Perform Encoding of a Message Using Matrix Multiplication (2 Hrs)
8. Write a Java program to sort a numeric array and a string array (2 hrs)
9. Write a Java program to remove a specific element from an array (3Hrs)
10. Write a Java program to get the minimum value of year, month, week, date from the current date of a default calendar (2Hrs)
11. Perform animation in applet (3 Hrs)
12. Write a java program to paint like paint brush in applet (2Hrs)
13. Program to display analog clock in applet (3Hrs)
14. Program to communicate two applets (3Hrs)
15. Write a Java program to convert a hash set to a tree set (2Hrs)
16. Create a runnable jar file in java? (3Hrs)
17. Display image on a button in swing (2Hrs)
18. Program to change the component color by choosing a color from ColorChooser (2Hrs)
19. Program to create a notepad in swing? (3Hrs)
20. Program to inherit Frame class (2Hrs)
21. Program to perform two tasks by two threads (3 Hrs)

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Activity 1

Aim: Write a Java Programme to print Hello on Screen.

Learning outcome: Able to understand how the web works.

Duration: 2 hours

List of Hardware/Software requirements:

1. JDK Setup
2. Windows/Ubuntu Operation System
3. Notepad Editor

Code/Program/Procedure (with comments):

```
class Hello {
        //Defining main method
public static void main(String args[])
{
        //main method body
        System.out.println("Hello");
}
}
```

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Output/Results snippet:

References:

- https://www.w3schools.com/java
- https://www.javatpoint.com/java-tutorial

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Activity 2

Aim: Write a Java Program to find arithmetic Operations.

Learning outcome: Able to understand how the web works.

Duration: 1 hour

List of Hardware/Software requirements:

4. JDK Setup
5. Windows/Ubuntu Operation System
6. Notepad Editor

Code/Program/Procedure (with comments):

```
public class Arithmetic
{
public static void main(String[] args)
{
int number1 = 10;
int number2 = 5;
//calculating number1 + number2;
int sum = number1 + number2;
//calculating number1 - number2;
int difference = number1 - number2;
//calculating number1 * number2;
int product = number1 * number2;
```

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```
//calculating number1 / number2;
int quot = number1 / number2;
//calculating number1 % number2;
int rem = number1 % number2;
//Displaying the values
System.out.println("number1 : "+number1);
System.out.println("number2 : "+number2);
System.out.println("sum : "+sum);
System.out.println("difference : "+difference);
System.out.println("product : "+product);
System.out.println("quot : "+quot);
System.out.println("rem : "+rem);
}
}
```

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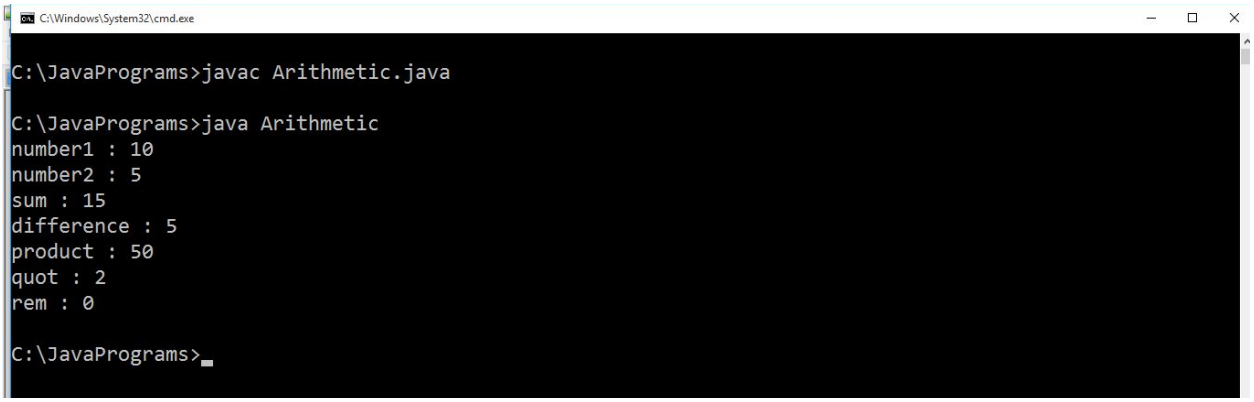
Output/Results snippet:



References:

- https://www.w3schools.com/java
- https://www.javatpoint.com/java-tutorial

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Activity 3

Aim: Write a Java Program to find biggest no. in given three nos.

Learning outcome: Able to understand how the web works.

Duration: 2 hours

List of Hardware/Software requirements:

7. JDK Setup
8. Windows/Ubuntu Operation System
9. Notepad Editor

Code/Program/Procedure (with comments):

```
import java.util.Scanner;
//importing scanner class for input
class Largest
{
public static void main(String args[])
{
//Defining Veriables
int x, y, z;
System.out.println("Enter three integers");
Scanner in = new Scanner(System.in);
x = in.nextInt();
```

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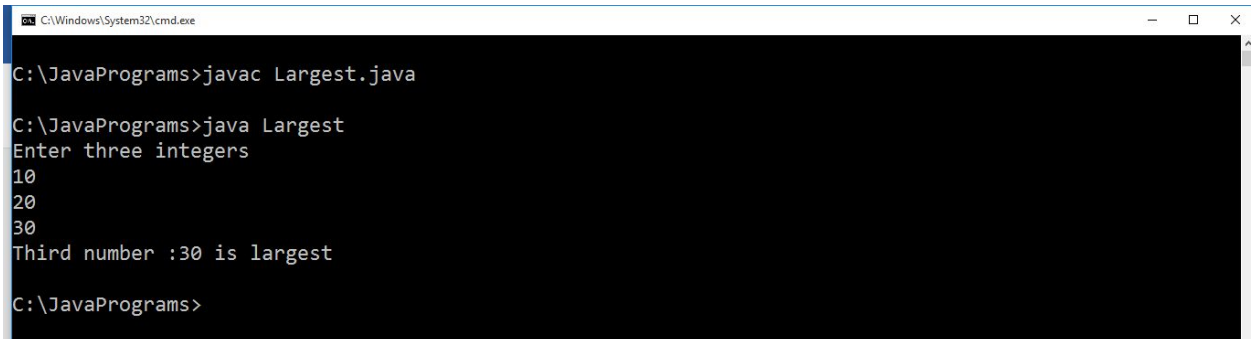
```
y = in.nextInt();

z = in.nextInt();

if (x > y && x > z)

System.out.println("First number is largest.");

else if (y > x && y > z)

System.out.println("Second number is largest.");

else if (z > x && z > y)

System.out.println("Third number :"+ z +" is largest");

else

System.out.println("The numbers are not distinct.");

}

}
```

Output/Results snippet:



References:

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- https://www.w3schools.com/java
- https://www.javatpoint.com/java-tutorial

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Activity 4

Aim: Write a java program to print Fibonacci series without using recursion and using recursion.

Learning outcome: Able to understand how the web works.

Duration: 2 hours

List of Hardware/Software requirements:

10. JDK Setup
11. Windows/Ubuntu Operation System
12. Notepad Editor

Code/Program/Procedure (with comments):

```
class FibonacciSeries
{
static int
n1=0,n2=1,n3=0;
//Defining function
static void printFibonacci(int count)
{
if(count>0)
{
n3 = n1 + n2;
n1 = n2;
```

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```
n2 = n3;
System.out.print(" "+n3);
printFibonacci(count-1);
}
}
public static void main(String args[]){
int count=10;
System.out.print(n1+" "+n2);//printing 0 and 1
printFibonacci(count-2);//n-2 because 2 numbers are already printed
}
}
```

Fibonacci Series using Recursion Method

```
class FibonacciSeriesReccursion
{
public static void main(String args[])
{
int n1=0,n2=1,n3,i,count=10;
System.out.print(n1+" "+n2);//printing 0 and 1
for(i=2;i<count;++i)//loop starts from 2 because 0 and 1 are already printed
{
n3=n1+n2;
System.out.print(" "+n3);
```

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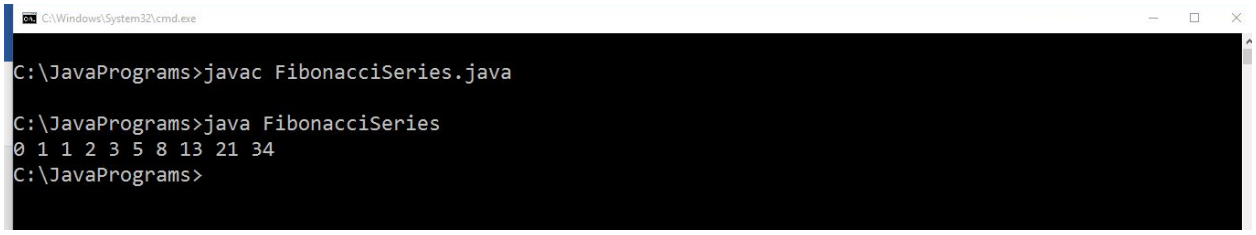
```
n1=n2;

n2=n3;

}

}}
```

Output/Results snippet:



References:

- https://www.w3schools.com/java
- https://www.javatpoint.com/java-tutorial

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Activity 5

Aim: Java Program to Solve any Linear Equation in One Variable

Learning outcome: Able to understand how the web works.

Duration: 3 hours

List of Hardware/Software requirements:

13. JDK Setup
14. Windows/Ubuntu Operation System
15. Notepad Editor

Code/Program/Procedure (with comments):

```
// Java program to solve
// the given equation
import java.io.*;
class LinearEquation
{
// Function to solve
// the given equation
static String solveEquation(String equation)
{
int n = equation.length(),
sign = 1, coeff = 0;
```

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```
int total = 0, i = 0;
// Traverse the equation
for (int j = 0; j < n; j++)
{
if (equation.charAt(j) == '+' || equation.charAt(j) == '-')
{
if (j > i)
total += sign *
Integer.parseInt(equation.substring(i, j));
i = j;
}
// For cases such
// as: x, -x, +x
else if (equation.charAt(j) == 'x')
{
if ((i == j) ||
equation.charAt(j - 1) == '+')
coeff += sign;
else if (equation.charAt(j - 1) == '-')
coeff -= sign;
else
coeff += sign *
```

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```
Integer.parseInt(equation.substring(i, j));
i = j + 1;
}
// Flip sign once
// '=' is seen
else if (equation.charAt(j) == '=')
{
if (j > i)
total += sign *
Integer.parseInt(equation.substring(i, j));
sign = -1;
i = j + 1;
}
}
// There may be a
// number left in the end
if (i < n)
total = total +
sign *
Integer.parseInt(equation.substring(i));
// For infinite
// solutions
```

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```
if (coeff == 0 &&
total == 0)
return "Infinite solutions";
// For no solution
if (coeff == 0 &&
total != 0)
return "No solution";
// x = total sum / coeff
// of x '-' sign indicates
// moving numeric value to
// right hand side
int ans = -total / coeff;
return (Integer.toString(ans));
}
// Driver code
public static void main(String args[])
{
String equation = new String("x+5-3+x=6+x-2");
System.out.print("x = " + solveEquation(equation));
}
}
```

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Output/Results snippet:

References:

- https://www.w3schools.com/java
- https://www.javatpoint.com/java-tutorial

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Activity 6

Aim: Java Program to Find Inverse of a Matrix

Learning outcome: Java: The key language.

Duration: 3 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

```
import java.util.Scanner;        //importing Scanner class
public class InverseMatrix {
public static void main(String args[]) {
int i, j;            //loop iterator var
float det, temp;
float mat[][] = new float[2][2];
Scanner sc = new Scanner(System.in);
System.out.println("Enter elements of 2x2 matrix row wise:");
for(i = 0; i < 2; ++i)              //loop to get values by row
        for(j = 0; j < 2; ++j)              //loop to get values by col
                mat[i][j] = sc.nextFloat();
det = (mat[0][0] * mat[1][1]) - (mat[0][1] * mat[1][0]);       //determinant calculation
```

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```
System.out.println("\ndeterminant = " + det);
//inverse calculation logic
temp = mat[0][0];
mat[0][0] = mat[1][1];
mat[1][1] = temp;
mat[0][1] = - mat[0][1];
mat[1][0] = - mat[1][0];
System.out.println("\nInverse of matrix is:");          //displaying output from here
for(i = 0; i < 2; ++i) {
        for(j = 0; j < 2; ++j)
                System.out.print((mat[i][j]/det) + " ");
        System.out.print("\n");
                }
        }
}
```

Output/Results snippet:

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```
Enter elements of matrix row wise:
1 2 3
4 5 6

determinant = -2.0

Inverse of matrix is:
-2.0 1.0
1.5 -0.5
```

References:

- Core Module 4 Web Development Lab

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Activity 7

Aim: Java Program to Perform Encoding of a Message Using Matrix Multiplication

Learning outcome: Java: The key language.

Duration: 2 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

```
import java.util.Scanner;                    //importing Scanner class
public class EncodingMatrix
{
public static void main(String args[])
{
int n;
Scanner input = new Scanner(System.in);      //user input
System.out.println("Enter the base of squared matrices");
n = input.nextInt();
int [][] a = new int[n][n];          //declaring 2D array
int [][] b = new int[n][n];          //declaring 2D array
int [][] c = new int[n][n];          //declaring 2D array
```

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```
System.out.println("Enter the elements of matrix to be encoded: ");
for(int i=0; i<n; i++)
        for(int j=0; j<n; j++)
                a[i][j] = input.nextInt();
for(int i=0; i<n; i++)
        for(int j=0; j<n; j++)
                b[i][j] = i+j;
for (int i = 0; i < n; i++)                    //deep nesting for loops for encoding
{
        for (int j = 0; j < n; j++)
                {
                        for (int k = 0; k < n; k++)
                        {
                                c[i][j] = c[i][j] + a[i][k] * b[k][j];
                        }
                }
}
System.out.println("The Encoded matrix is:");
for(int i=0; i<n; i++)                 //deep nesting for loops for displaying
{
        for(int j=0; j<n; j++)
        {
```

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```
                System.out.print(c[i][j] + " ");          //display values with space seperation
                }
        System.out.println();
}
input.close();              //closing input stream
        }
}
```

Output/Results snippet:

```
Enter the base of squared matrices
2
Enter the elements of matrix to be encoded:
1 5
3 9
The Encoded matrix is:
5 11
9 21
```

References:

- Core Module 4 Web Development Lab

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Activity 8

Aim: Write a Java program to sort a numeric array and a string array

Learning outcome: Java: The key language.

Duration: 2 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

```
import java.util.Arrays;                    //Array class imported
public class NumericStringArray {
public static void main(String[] args){
int[] my_array1 = {                 //pre-defined array elements for Numeric data
1789, 2035, 1899, 1456, 2013,
1458, 2458, 1254, 1472, 2365,
1456, 2165, 1457, 2456};
String[] my_array2 = {                      //pre-defined array elements for String data
"Java",
"Python",
"PHP",
"C#",
```

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```
"C Programming",
"C++"
};
System.out.println("Original numeric array : "+Arrays.toString(my_array1));
Arrays.sort(my_array1);                    //Sorting by function Arrays_sort()
System.out.println("Sorted numeric array : "+Arrays.toString(my_array1));
System.out.println("Original string array : "+Arrays.toString(my_array2));
Arrays.sort(my_array2);                    //Sorting by function Arrays_sort()
System.out.println("Sorted string array : "+Arrays.toString(my_array2));
        }
}
```

Output/Results snippet:

```
Original numeric array : [1789, 2035, 1899, 1456, 2013, 1458, 2458, 1254, 1472
, 2365, 1456, 2165, 1457, 2456]
Sorted numeric array : [1254, 1456, 1456, 1457, 1458, 1472, 1789, 1899, 2013,
2035, 2165, 2365, 2456, 2458]
Original string array : [Java, Python, PHP, C#, C Programming, C++]
Sorted string array : [C Programming, C#, C++, Java, PHP, Python]
```

References:

- Core Module 4 Web Development Lab

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Activity 9

Aim: Write a Java program to remove a specific element from an array

Learning outcome: Java: The key language.

Duration: 3 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

```
import java.util.Scanner;                    //Scanner class imported to receive input from user
public class Delete
{
public static void main(String[] args)
{
int n, x, flag = 1, loc = 0;
Scanner s = new Scanner(System.in);
System.out.print("Enter no. of elements you want in array:");
n = s.nextInt();                             //user input initiated
int a[] = new int[n];
System.out.println("Enter all the elements:");
for (int i = 0; i < n; i++)                  //loop to take multiple values input
```

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```
        {
                a[i] = s.nextInt();                    //user input saved
        }
System.out.print("Enter the element you want to delete:");
x = s.nextInt();
for (int i = 0; i < n; i++)                    //checking for value match
        {
                if(a[i] == x)
                        {
                        flag =1;
                        loc = i;
                        break;              //break if value match found
                        }
                else
                        {
                        flag = 0;                    //set flag as '0' if not found
                        }
        }
if(flag == 1)
        {
        for(int i = loc+1; i < n; i++)
                {
```

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```
            a[i-1] = a[i];              //deletion by shifting
            }
        System.out.print("After Deleting:");
        for (int i = 0; i < n-2; i++)               //display after deletion
            {
            System.out.print(a[i]+",");
            }
        System.out.print(a[n-2]);
        }
        else                //if not found, display error
            {
            System.out.println("Element not found");
            }
        }
}
```

Output/Results snippet:

```
Enter no. of elements you want in array:5
Enter all the elements:
3
5
8
1
9
Enter the element you want to delete:8
After Deleting:3,5,1,9
```

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References:

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Activity 10

Aim: Write a Java program to get the minimum value of year, month, week, date from the current date of a default calendar

Learning outcome: Java: The key language.

Duration: 2 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

```
import java.util.*;                 //util class import for calendar

public class Calender {

public static void main(String[] args)

{

// Create a default calendar

Calendar cal = Calendar.getInstance();

System.out.println();

System.out.println("\nCurrent Date and Time:" + cal.getTime());    //get Time info

//select year, month, week, date from calendar object

int actualMaxYear = cal.getActualMinimum(Calendar.YEAR);

int actualMaxMonth = cal.getActualMinimum(Calendar.MONTH);

int actualMaxWeek = cal.getActualMinimum(Calendar.WEEK_OF_YEAR);
```

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```
int actualMaxDate = cal.getActualMinimum(Calendar.DATE);
//display values obtained
System.out.println("Actual Minimum Year: "+actualMaxYear);
System.out.println("Actual Minimum Month: "+actualMaxMonth);
System.out.println("Actual Minimum Week of Year: "+actualMaxWeek);
System.out.println("Actual Minimum Date: "+actualMaxDate+"\n");
System.out.println();
}
}
```

Output/Results snippet:

```
Current Date and Time:Mon Jun 01 08:40:58 IST 2020
Actual Minimum Year: 1
Actual Minimum Month: 0
Actual Minimum Week of Year: 1
Actual Minimum Date: 1
```

References:

- Core Module 4 Web Development Lab

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Activity 11

Aim: Perform animation in applet

Learning outcome: Java: The key language.

Duration: 3 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

Animation.java

```
import java.awt.*;              //import abstract windows toolkit classes
import java.applet.*;           //import applet classes
public class Animation extends Applet {
Image picture;
public void init() {
picture =getImage(getDocumentBase(),"flower.jpg");        //reading image from directory
}
public void paint(Graphics g) {                 //initiating graphics class parameters
for(int i=0;i<500;i++){                 //looping till all pixels shifted
g.drawImage(picture, i,30, this);               //display image in applet
try{Thread.sleep(100);}catch(Exception e){}                 //allow delay
```

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```
                }
        }
}
```

Animation.html

```
<html>
<body>
<applet code="Animation.class" width="300" height="300">
</applet>
</body>
</html>
```

flower.jpg (example image)

Output/Results snippet:

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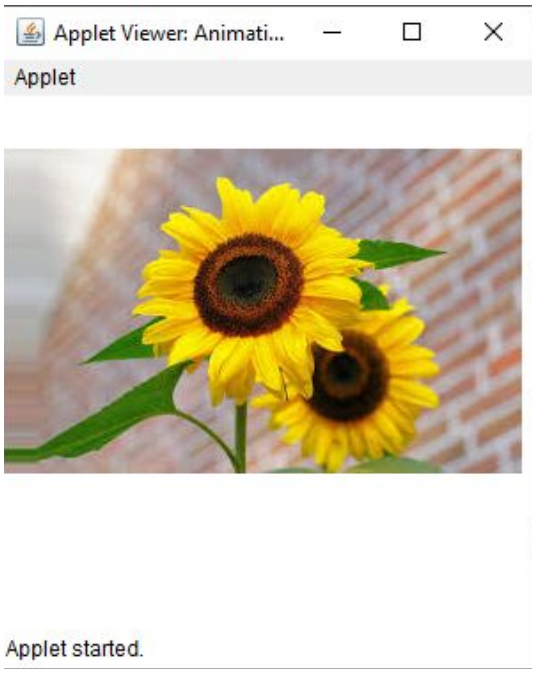

References:

- Core Module 4 Web Development Lab

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Activity 12

Aim: Write a java program to paint like paint brush in applet

Learning outcome: Java: The key language.

Duration: 2 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

PaintBrush.java

```
// import required java libraries

import java.awt.*;

import java.awt.event.*;

import java.applet.Applet;

public class PaintBrush extends Applet implements MouseListener, MouseMotionListener,
ActionListener

{

// component declarations

Button blackButton;

Button redButton;

Button greenButton;

Button blueButton;
```

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```
Button penButton;
Button lineButton;
Button eraserButton;
Button clearButton;
Button squareButton;
Button ovalButton;
Button fillSquareButton;
Button fillOvalButton;
Label colourTitle;
Label colourDisplay;
Label toolTitle;
Label toolDisplay;
// required variables to store settings
Color currentColour;
int toolType;
// variables to store interim coordinates
int oldX = -1;
int oldY = -1;
public void init()
{
// create all the buttons
blackButton = new Button("Black");
```

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```
redButton = new Button("Red");
greenButton = new Button("Green");
blueButton = new Button("Blue");
penButton = new Button("Pen");
lineButton = new Button("Line");
eraserButton = new Button("Eraser");
clearButton = new Button("Clear");
squareButton = new Button("Square");
ovalButton = new Button("Oval");
fillSquareButton = new Button("F Square");
fillOvalButton = new Button("F Oval");
// add action listners for all the buttons
blackButton.addActionListener(this);
redButton.addActionListener(this);
greenButton.addActionListener(this);
blueButton.addActionListener(this);
penButton.addActionListener(this);
lineButton.addActionListener(this);
eraserButton.addActionListener(this);
clearButton.addActionListener(this);
squareButton.addActionListener(this);
ovalButton.addActionListener(this);
```

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```
fillSquareButton.addActionListener(this);
fillOvalButton.addActionListener(this);
// create the button bar panel
Panel buttonPanel = new Panel();
buttonPanel.setLayout(new GridLayout(6, 2));
buttonPanel.add(blackButton);
buttonPanel.add(redButton);
buttonPanel.add(greenButton);
buttonPanel.add(blueButton);
buttonPanel.add(penButton);
buttonPanel.add(lineButton);
buttonPanel.add(eraserButton);
buttonPanel.add(clearButton);
buttonPanel.add(squareButton);
buttonPanel.add(ovalButton);
buttonPanel.add(fillSquareButton);
buttonPanel.add(fillOvalButton);
// create the status bar panel
colourTitle = new Label("Colour: ");
currentColour = Color.black;
colourDisplay = new Label("Black");
toolTitle = new Label(" Selected Tool: ");
```

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```
toolType = 0;
toolDisplay = new Label("Pen (Scribble)");
Panel statusPanel = new Panel();
statusPanel.setLayout(new FlowLayout(FlowLayout.CENTER));
statusPanel.add(colourTitle);
statusPanel.add(colourDisplay);
statusPanel.add(toolTitle);
statusPanel.add(toolDisplay);
// arrange final panels in a border layout
this.setLayout(new BorderLayout());
this.add(buttonPanel, BorderLayout.WEST);
this.add(statusPanel, BorderLayout.NORTH);
// add mouse listners to applet
this.addMouseListener(this);
this.addMouseMotionListener(this);
}
// event handling for when an action occurs (in this case, whenever
// a button is pressed)
public void actionPerformed(ActionEvent e)
{
// get the local graphics page to draw on
Graphics page = this.getGraphics();
```

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```
// red button pressed: set the current colour to red
// and update the status display
if (e.getSource().equals(redButton))
{
currentColour = Color.red;
colourDisplay.setText("Red");
}
// blue button pressed: set the current colour to blue
// and update the status display
if (e.getSource().equals(blueButton))
{
currentColour = Color.blue;
colourDisplay.setText("Blue");
}
// green button pressed: set the current colour to green
// and update the status display
if (e.getSource().equals(greenButton))
{
currentColour = Color.green;
colourDisplay.setText("Green");
}
// black button pressed: set the current colour to black
```

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```
// and update the status display
if (e.getSource().equals(blackButton))
{
currentColour = Color.black;
colourDisplay.setText("Black");
}
// pen button pressed: set the selected tool to '0'
// and update the status display
if (e.getSource().equals(penButton))
{
toolType = 0;
toolDisplay.setText("Pen (Scribble)");
}
// eraser button pressed: set the selected tool to '1'
// and update the status display
if (e.getSource().equals(eraserButton))
{
toolType = 1;
toolDisplay.setText("Eraser");
}
// square button pressed: set the selected tool to '2'
// and update the status display
```

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```
if (e.getSource().equals(squareButton))
{
toolType = 2;
toolDisplay.setText("Square");
}
// oval button pressed: set the selected tool to '3'
// and update the status display
if (e.getSource().equals(ovalButton))
{
toolType = 3;
toolDisplay.setText("Oval");
}
// filled square button pressed: set the selected tool to '4'
// and update the status display
if (e.getSource().equals(fillSquareButton))
{
toolType = 4;
toolDisplay.setText("Filled Square");
}
// filled oval button pressed: set the selected tool to '5'
// and update the status display
if (e.getSource().equals(fillOvalButton))
```

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```
{
toolType = 5;
toolDisplay.setText("Filled Oval");
}
// clear button pressed: get the size of the applet and draw
// a clearing rectangle over it, to clear the screen
if (e.getSource().equals(clearButton))
{
Dimension size = this.getSize();
page.clearRect(0, 0, size.width, size.height);
}
// line button pressed: set the selected tool to '6'
// and update the status display
if (e.getSource().equals(lineButton))
{
toolType = 6;
toolDisplay.setText("Line");
}
}
// event handling for when the mouse button is first pressed
public void mousePressed(MouseEvent e)
{
```

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```
// store the coordinates for future reference
oldX = e.getX();
oldY = e.getY();
}
// event handling for when the mouse is dragged with the button
// held down
public void mouseDragged(MouseEvent e)
{
Graphics page = this.getGraphics();
// scribble tool: draw a line from the old coordinates to the
// new ones
if (toolType == 0)
{
page.setColor(currentColour);
page.drawLine(oldX, oldY, e.getX(), e.getY());
oldX = e.getX();
oldY = e.getY();
}
// eraser tool: clear a small rectangles' worth at the specified
// coordinate
if (toolType == 1)
{
```

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```
page.clearRect(e.getX(), e.getY(), 10, 10);
page.setColor(currentColour);
}
}
// resolve method: used to swap two numbers around so the
// smaller is always in element 0, and the larger in element
// 1, of the returned array
public int[] resolve(int newC, int oldC)
{
int start, end;
if (newC < oldC)
{
start = newC;
end = oldC;
}
else
{
start = oldC;
end = newC;
}
int[] blah = {start, end};
return blah;
```

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```
}
// event handling for when the mouse button is released
public void mouseReleased(MouseEvent e)
{
// get the applet's Graphics page
Graphics page = this.getGraphics();
// resolve the coordinates so that the smaller of the x and y
// coordinates can be picked out easily
int newX = e.getX();
int newY = e.getY();
int[] x = resolve(newX, oldX);
int[] y = resolve(newY, oldY);
// tool type 2: draw a rectangle
if (toolType == 2)
{
page.setColor(currentColour);
page.drawRect(x[0], y[0], (x[1] - x[0]), (y[1] - y[0]));
}
// tool type 3: draw an oval
if (toolType == 3)
{
page.setColor(currentColour);
```

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```
page.drawOval(x[0], y[0], (x[1] - x[0]), (y[1] - y[0]));
}
// tool type 4: draw a filled rectangle
if (toolType == 4)
{
page.setColor(currentColour);
page.fillRect(x[0], y[0], (x[1] - x[0]), (y[1] - y[0]));
}
// tool type 5: draw a filled oval
if (toolType == 5)
{
page.setColor(currentColour);
page.fillOval(x[0], y[0], (x[1] - x[0]), (y[1] - y[0]));
}
// tool type 6: draw the line
if (toolType == 6)
{
page.setColor(currentColour);
page.drawLine(oldX, oldY, newX, newY);
}
}
// unused methods from listener interfaces
```

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```
public void mouseEntered(MouseEvent e) {}
public void mouseExited(MouseEvent e) {}
public void mouseMoved(MouseEvent e) {}
public void mouseClicked(MouseEvent e) {}
}
```

PaintBrush.html

```
<html>
<body>
<applet code="PaintBrush.class" width="300" height="300">
</applet>
</body>
</html>
```

Output/Results snippet:

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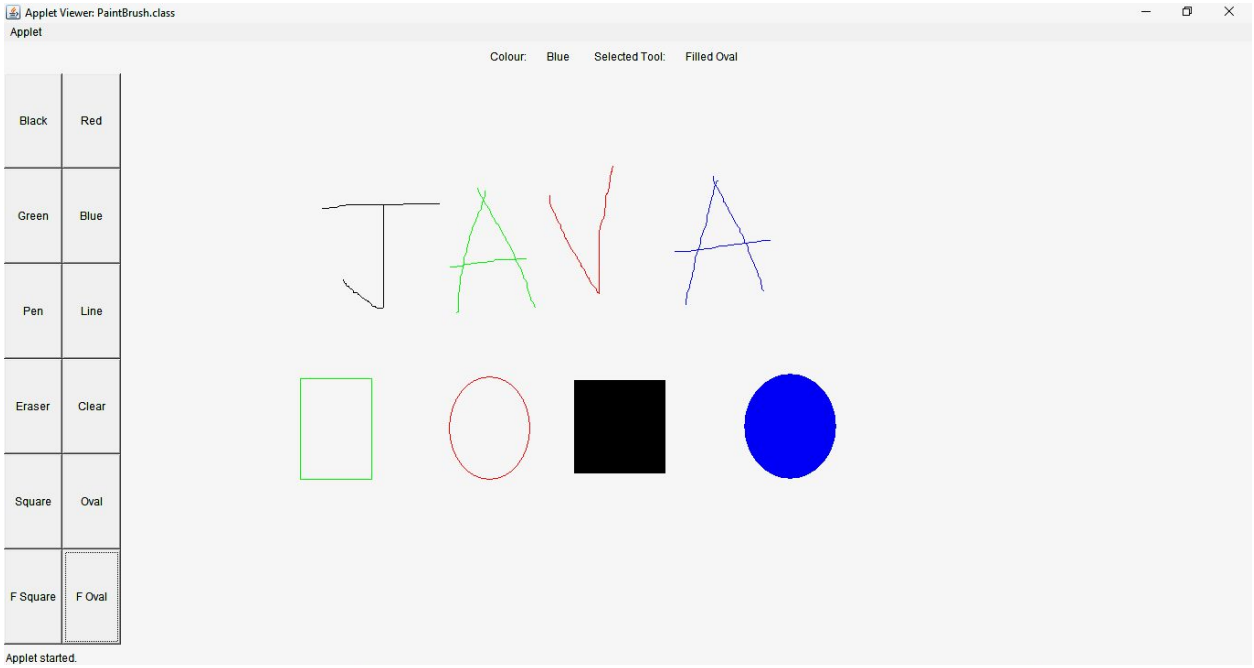

References:

- Core Module 4 Web Development Lab

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Activity 13

Aim: Program to display analog clock in applet

Learning outcome: Java: The key language.

Duration: 3 hours

List of Hardware/Software requirements:

1. Computer System with minimum 1GB RAM
2. OS: Minimum Microsoft Windows 7 or Ubuntu 12
3. JAVA 8 or higher

Code/Program/Procedure (with comments):

AnalogClock.java

```
import java.applet.*;              //importing classes for applet, aws and util
import java.awt.*;
import java.util.*;
import java.text.*;
public class AnalogClock extends Applet implements Runnable {
//declaring all varaibles
int width, height;
Thread t = null;
boolean threadSuspended;      //thread var
int hours=0, minutes=0, seconds=0;
String timeString = "";
```

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```
public void init() {      //starting applet
        width = getSize().width;
        height = getSize().height;
        setBackground( Color.black );
        }
public void start() {              //starting applet thread
        if ( t == null ) {
                t = new Thread( this );
                t.setPriority( Thread.MIN_PRIORITY );       //priority set to minimum
                threadSuspended = false;
                t.start();
        }
        else {
                if ( threadSuspended ) {
                threadSuspended = false;
                synchronized( this ) {            //sync thread operation
                notify();
        }
        }
}
}
public void stop() {
```

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```
                threadSuspended = true;
        }
public void run() {             //running thread over applets
                try {
                while (true) {
                        //finding time dimensions of hour, mins, seconds
                        Calendar cal = Calendar.getInstance();
                        hours = cal.get( Calendar.HOUR_OF_DAY );
                        if ( hours > 12 ) hours -= 12;
                        minutes = cal.get( Calendar.MINUTE );
                        seconds = cal.get( Calendar.SECOND );
                        SimpleDateFormat formatter
                        = new SimpleDateFormat( "hh:mm:ss", Locale.getDefault() );
                        Date date = cal.getTime();
                        timeString = formatter.format( date );
                        // Now the thread checks to see if it should suspend itself
                        if ( threadSuspended ) {
                        synchronized( this ) {
                        while ( threadSuspended ) {
                        wait();
                        }
                }
```

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```
        }
repaint();              //repainting applet window output after each thread loop iteration
t.sleep( 1000 ); // interval specified in milliseconds
        }
}
catch (Exception e) { }
                }
void drawHand( double angle, int radius, Graphics g ) {     //drawing hands
                angle -= 0.5 * Math.PI;
                int x = (int)( radius*Math.cos(angle) );
                int y = (int)( radius*Math.sin(angle) );
                g.drawLine( width/2, height/2, width/2 + x, height/2 + y );
                }
void drawWedge( double angle, int radius, Graphics g ) {    //drawing wedge
                angle -= 0.5 * Math.PI;
                int x = (int)( radius*Math.cos(angle) );
                int y = (int)( radius*Math.sin(angle) );
                angle += 2*Math.PI/3;
                int x2 = (int)( 5*Math.cos(angle) );
                int y2 = (int)( 5*Math.sin(angle) );
                angle += 2*Math.PI/3;
                int x3 = (int)( 5*Math.cos(angle) );
```

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```
                int y3 = (int)( 5*Math.sin(angle) );
                g.drawLine( width/2+x2, height/2+y2, width/2 + x, height/2 + y );
                g.drawLine( width/2+x3, height/2+y3, width/2 + x, height/2 + y );
                g.drawLine( width/2+x2, height/2+y2, width/2 + x3, height/2 + y3 );
                }
public void paint( Graphics g ) {       //paint all graphics
                g.setColor( Color.gray );       //set color
                drawWedge( 2*Math.PI * hours / 12, width/5, g );
                drawWedge( 2*Math.PI * minutes / 60, width/3, g );
                drawHand( 2*Math.PI * seconds / 60, width/2, g );
                g.setColor( Color.white );
                g.drawString( timeString, 10, height-10 );
                }
}
```

AnalogClock.html

```
<html>
<body>
<applet code="AnalogClock.class" width="300" height="300">
</applet>
</body>
</html>
```

Output/Results snippet:

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References:

- Core Module 4 Web Development Lab

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Activity 14

Aim: Program to communicate two applets (3 Hrs)

Learning outcome: Java: The key language.

Duration: 3 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

ContextApplet.java

```
//import all the predefined library
import java.applet.*;
import java.awt.*;
import java.awt.event.*;

//create a class and inherit fromApplet class
public class ContextApplet extends Applet implements ActionListener{
//Button class object
Button b;
public void init(){
```

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```
b=new Button("Click");
b.setBounds(50,50,60,50);
add(b);
b.addActionListener(this);
}
//Function of action Listener
public void actionPerformed(ActionEvent e){
AppletContext ctx=getAppletContext();
Applet a=ctx.getApplet("app2");
a.setBackground(Color.yellow);
}
}
```

First.java

```
//import all the predefined library
import javax.swing.*;
//create a class
public class First{
//create a constructor
First(){
JFrame f=new JFrame();
JButton b=new JButton("click");
```

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```
b.setBounds(130,100,100, 40);
f.add(b);
f.setSize(300,400);
f.setLayout(null);
f.setVisible(true);
f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
public static void main(String[] args) {
//calling the constructor
new First();
}
}
```

//HTML pages for applets

ContextApplet.html

```
<html>
<body>
<applet code="ContextApplet.class" width="150" height="150" name="app1">
</applet>
<applet code="First.class" width="150" height="150" name="app2">
</applet>
</body>
```

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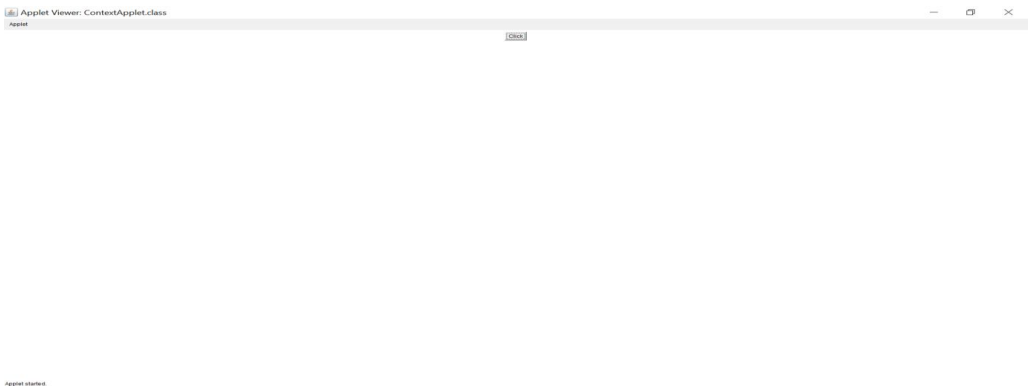
</html>

Output/Results snippet:



References:

- https://codingbat.com/java/Logic-1
- https://javarevisited.blogspot.com/2017/07/top-50-java-programs-from-coding-Interviews.html

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Activity 15

Aim: Write a Java program to convert a hash set to a tree set

Learning outcome: Java: The key language.

Duration: 2 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

```
//import all the predefined library
import java.util.HashSet;
import java.util.TreeSet;
import java.util.Set;
//create a class
class ConvertHashSettoTreeSet{
public static void main(String[] args) {
// Create a HashSet
HashSet<String> hset = new HashSet<String>();
//add elements to HashSet
hset.add("Element1");
```

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```
hset.add("Element2");
hset.add("Element3");
hset.add("Element4");
// Displaying HashSet elements
System.out.println("HashSet contains: "+ hset);
// Creating a TreeSet of HashSet elements
Set<String> tset = new TreeSet<String>(hset);
// Displaying TreeSet elements
System.out.println("TreeSet contains: ");
for(String temp : tset){
System.out.println(temp);
}
}
}
```

Output/Results snippet:

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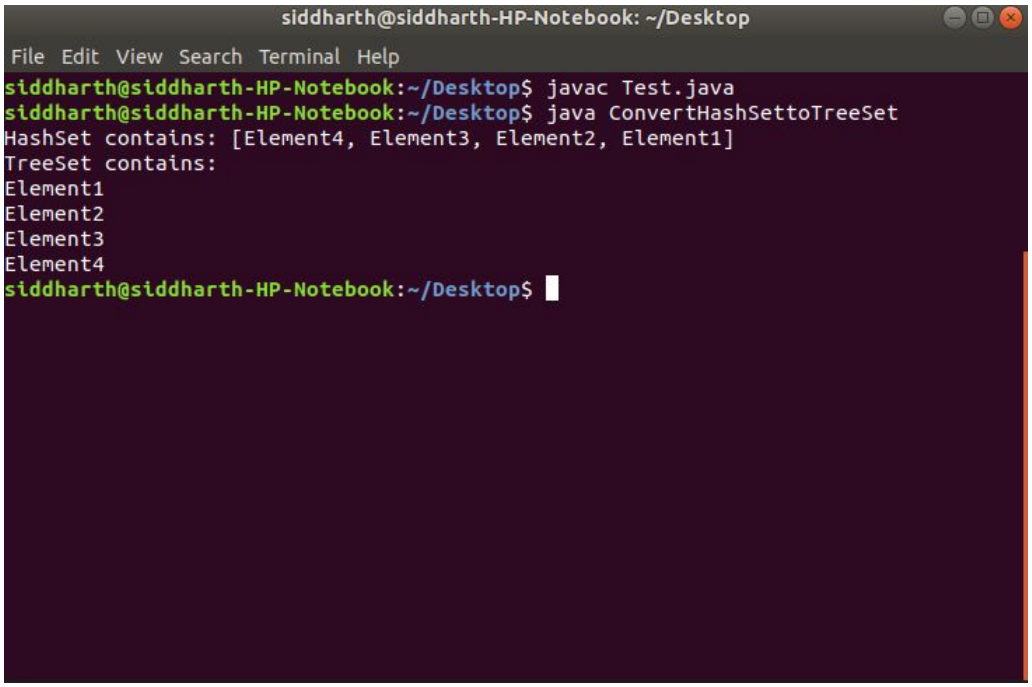

References:

- https://codingbat.com/java/Logic-1
- https://javarevisited.blogspot.com/2017/07/top-50-java-programs-from-coding-Interviews.html

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Activity 16

Aim: Create runnable jar file in java (3 Hrs)

Learning outcome: Java: The key language.

Duration: 3 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

First.java

```
//import all the predefined library
import javax.swing.*;
//create a class
public class First{
//create a constructor
First(){
JFrame f=new JFrame();
JButton b=new JButton("click");
b.setBounds(130,100,100, 40);
f.add(b);
```

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```
f.setSize(300,400);
f.setLayout(null);
f.setVisible(true);
f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
public static void main(String[] args) {
//calling the constructor
new First();
}
}
```

myfile.mf

Main-Class: First

Output/Results snippet:

javac First.java

jar –cvmf myfile.mf myjar.jar First.class

Now it will create the executable jar file.

If you double click on it, it will call the main method of the First class.

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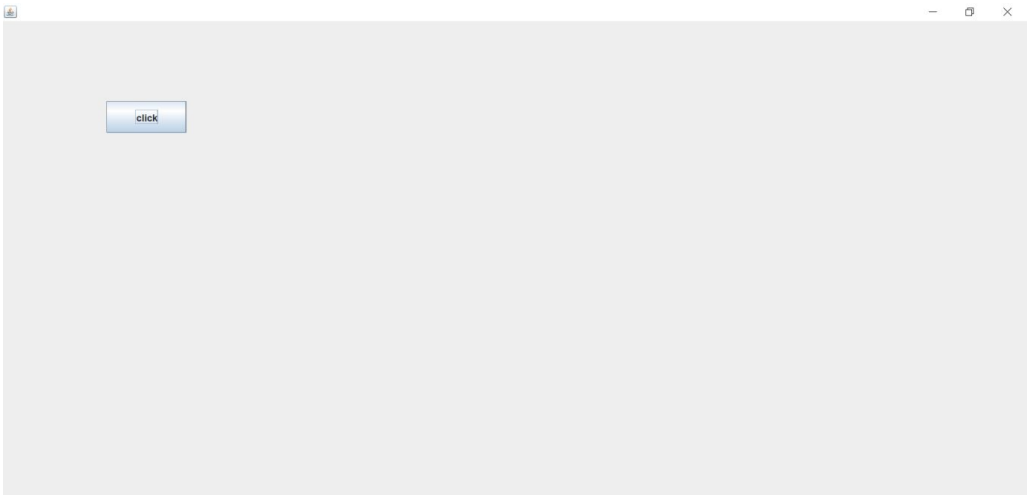

References:

- https://codingbat.com/java/Logic-1
- https://javarevisited.blogspot.com/2017/07/top-50-java-programs-from-coding-Interviews.html

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Activity 17

Aim: Display image on a button in swing (2 Hrs)

Learning outcome: Java: The key language.

Duration: 2 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

```
//import all the predefined library
import javax.swing.*;
//create class
public class ButtonExample{
//constructor of class
ButtonExample(){
JFrame f=new JFrame("Button Example");
JButton b=new JButton(new ImageIcon("button.jpg"));
b.setBounds(100,100,100, 40);
f.add(b);
f.setSize(300,400);
```

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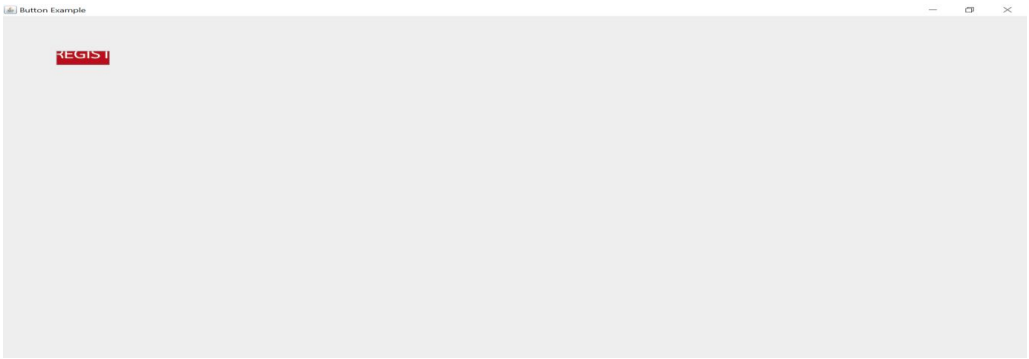
```
f.setLayout(null);
f.setVisible(true);
f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
public static void main(String[] args) {
//invoking constructor
new ButtonExample();
}
}
```

Output/Results snippet:



References:

- https://codingbat.com/java/Logic-1
- https://javarevisited.blogspot.com/2017/07/top-50-java-programs-from-coding-Interviews.html

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Activity 18

Aim: Program to change the component color by choosing a color from ColorChooser (2 Hrs)

Learning outcome: Java: The key language.

Duration: 2 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

```
//import all the predefined library
import java.awt.event.*;
import java.awt.*;
import javax.swing.*;
//create a class and inherit from JFrame class
public class ColorChooserExample extends JFrame implements ActionListener {
JButton b;
Container c;
ColorChooserExample(){
c=getContentPane();
```

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```
c.setLayout(new FlowLayout());
b=new JButton("color");
b.addActionListener(this);
c.add(b);
}
//click event of the button
public void actionPerformed(ActionEvent e) {
Color initialcolor=Color.RED;
//Color Dialog Box
Color color=JColorChooser.showDialog(this,"Select a color",initialcolor);
c.setBackground(color);
}
public static void main(String[] args) {
ColorChooserExample ch=new ColorChooserExample();
ch.setSize(400,400);
ch.setVisible(true);
ch.setDefaultCloseOperation(EXIT_ON_CLOSE);
}
}
```

Output/Results snippet:

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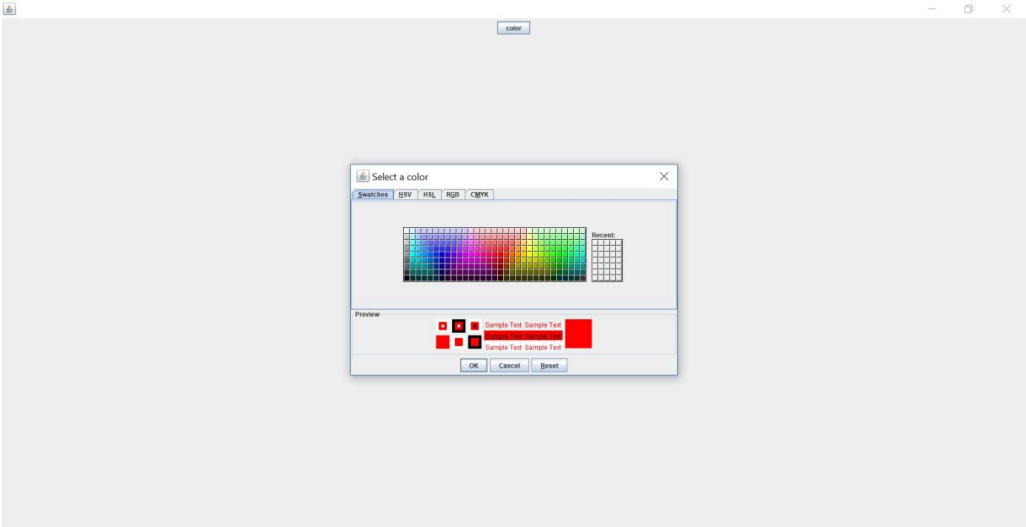

References:

- https://codingbat.com/java/Logic-1
- https://javarevisited.blogspot.com/2017/07/top-50-java-programs-from-coding-Interviews.html

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Activity 19

Aim: Program to create a notepad in swing (3 Hrs)

Learning outcome: Java: The key language.

Duration: 3 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

Main.java

```
//import all the predefined library and create the main class
import javax.swing.JFrame;
public class Main {
public static void main(String args[]){
JFrame frame = new Grid();
frame.setTitle("Notepad");
frame.setVisible(true);
frame.setSize(1280, 720);
frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
frame.setResizable(true);
```

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```
frame.setLocationRelativeTo(null);
}
}
```

//import all the predefined library and create the Grid class for layout

Grid.java

```
import java.awt.Menu;
import java.awt.MenuBar;
import java.awt.MenuItem;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.io.BufferedWriter;
import java.io.FileReader;
import java.io.FileWriter;
import java.util.Scanner;
import javax.swing.JFileChooser;
import javax.swing.JFrame;
import javax.swing.JTextArea;
public class Grid extends JFrame{
int fileToOpen;
int fileToSave;
JFileChooser fileOpen;
JFileChooser fileSave;
```

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```
Grid(){  //constructor of grid
MenuBar menuBar = new MenuBar();
MenuItem menutem = new MenuItem();
final JTextArea textArea = new JTextArea();
setMenuBar(menuBar);
Menu file = new Menu("File");
menuBar.add(file);
MenuItem newOption = new MenuItem("New");
MenuItem open = new MenuItem("Open");
MenuItem save = new MenuItem("Save");
MenuItem close = new MenuItem("Exit");
file.add(newOption);
file.add(open);
file.add(save);
file.add(close);
getContentPane().add(textArea);
newOption.addActionListener(new ActionListener(){
public void actionPerformed(ActionEvent e){
textArea.setText("");
}
});
open.addActionListener(new ActionListener(){
```

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```
public void actionPerformed(ActionEvent e){
openFile();
if (fileToOpen == JFileChooser.APPROVE_OPTION){
textArea.setText("");
try{
Scanner scan = new Scanner(new FileReader(fileOpen.getSelectedFile().getPath()));
while (scan.hasNext())
textArea.append(scan.nextLine());
} catch (Exception ex){
System.out.println(ex.getMessage());
}
}
}
});
save.addActionListener(new ActionListener(){
public void actionPerformed(ActionEvent e){
saveFile();
if (fileToSave == JFileChooser.APPROVE_OPTION){
try {
BufferedWriter
out=new
BufferedWriter(new
```

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```
FileWriter(fileSave.getSelectedFile().getPath()));
out.write(textArea.getText());
out.close();
} catch (Exception ex) {
System.out.println(ex.getMessage());
}
}
}
});
close.addActionListener(new ActionListener(){
public void actionPerformed(ActionEvent e){
System.exit(0);
}
});
}
public void openFile(){
JFileChooser open = new JFileChooser();
int option = open.showOpenDialog(this);
fileToOpen = option;
fileOpen = open;
}
public void saveFile(){
```

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```
JFileChooser save = new JFileChooser();
int option = save.showOpenDialog(this);
fileToSave = option;
fileSave = save;
}
}
```

Output/Results snippet:

References:

- https://codingbat.com/java/Logic-1
- https://javarevisited.blogspot.com/2017/07/top-50-java-programs-from-coding-Interviews.html

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Activity 20

Aim: Program to inherit Frame class (2 Hrs)

Learning outcome: Java: The key language.

Duration: 2 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

```
import java.awt.*;
class FirstInherit extends Frame{
FirstInherit(){
Button b=new Button("click me");
b.setBounds(30,100,80,30);// setting button position
add(b);//adding button into frame
setSize(300,300);//frame size 300 width and 300 height
setLayout(null);//no layout manager
setVisible(true);//now frame will be visible, by default not visible
}
public static void main(String args[]){
```

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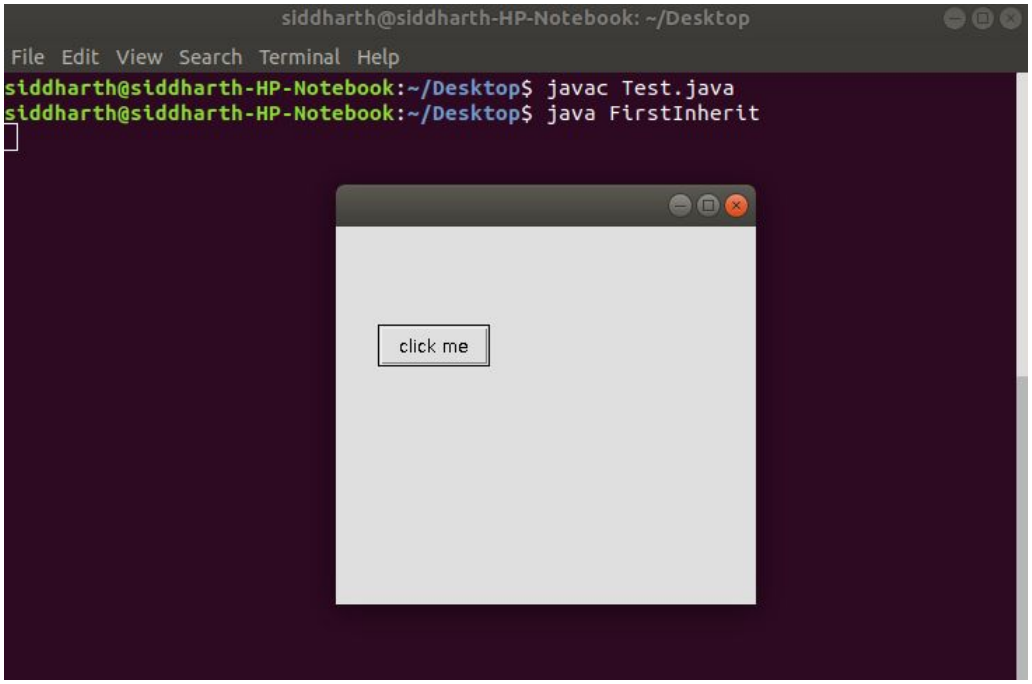
```
FirstInherit f=new FirstInherit();
}
}
```

Output/Results snippet:



References:

- https://codingbat.com/java/Logic-1
- https://javarevisited.blogspot.com/2017/07/top-50-java-programs-from-coding-Interviews.html

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Activity 21

Aim: Program to perform two tasks by two threads (3 Hrs)

Learning outcome: Java: The key language.

Duration: 3 hour

List of Hardware/Software requirements:

- Windows / Linux OS
- Installed jdk 1.5 or above
- Editor Notepad++

Code/Program/Procedure (with comments):

```
class TestMultitasking4{
public static void main(String args[]){
//Create a thread
Thread t1=new Thread(){
//Override the run method
public void run(){
System.out.println("task one");
}
};
//Create a thread
Thread t2=new Thread(){
```

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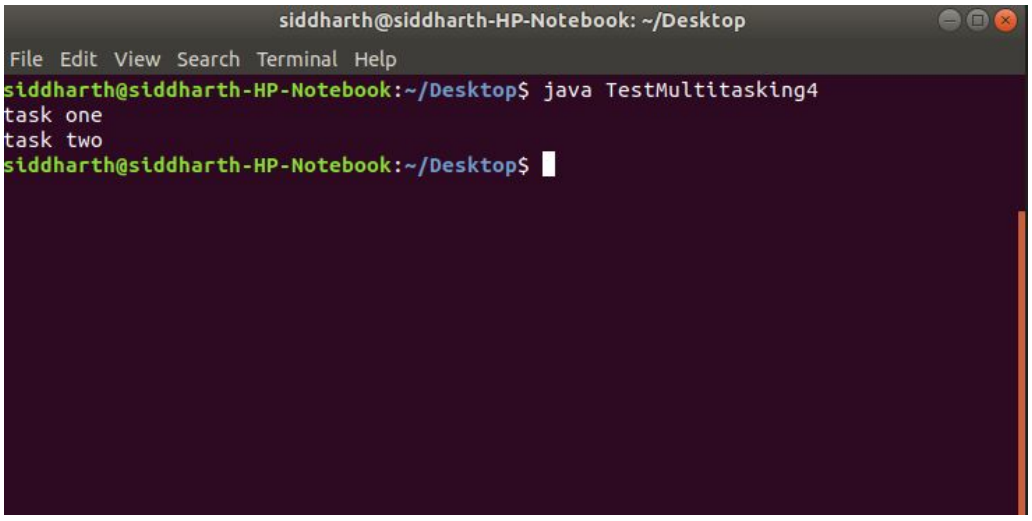
```
public void run(){ //Override the run method
System.out.println("task two");
}
};
//Invoke the threads
t1.start();
t2.start();
}
}
```

Output/Results snippet:



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References:

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EoF

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